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TABLE OF CONTENTS

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ADDRESS

THE PRINCIPLES UNDERLYING THE SURGERY OF THE PANCREAS. *By John B. Deaver, M.D.*, Philadelphia 187

ORIGINAL ARTICLES

THE SENSORY EVIDENCE OF NERVE REGENERATION. *By Isador H. Coriat, M.D.*, Boston 192
POSSIBILITIES IN SOCIAL SERVICE FOR PSYCHOPATHIC PATIENTS *By Mary C. Jarrett*, Boston 201
INEBRIETY FROM A MEDICAL VIEWPOINT. *By Irwin H. Neff, M.D.*, Norfolk, Mass. 204
THE FRAMINGHAM HEALTH AND TUBERCULOSIS DEMONSTRATION. *By D. B. Armstrong, M.D.*, Framingham, Mass. 206

THERAPEUTIC AND PREVENTIVE MEDICINE

THE DRUG TREATMENT OF MORPHINISM. *By Frank H. Carlisle, M.D.*, Norfolk, Mass. 209

CLINICAL DEPARTMENT

REPORT OF A CASE OF CONGENITAL ALOPECIA. *By J. Harper Blaisdell, M.D.*, and *A. R. Cunningham, M.D.*, Boston 210

BOOK REVIEWS

The Harvard Medical School and Its Clinical Opportunities. By Leroy E. Parkins, A.B. 211
The Practice of Urology. By Charles H. Chetwood, M.D. 211

EDITORIALS

MEDICAL EXPLOITATION OF THE IMMIGRANT 212
SUDHOFF'S COPENHAGEN CODEX 213
EXTENSION COURSES OF THE HARVARD MEDICAL SCHOOL 213
THE PERIL OF SMALLPOX 214
MEDICAL NOTES 214

MEMORIAL RESOLUTIONS

MEMORIAL RESOLUTIONS FOR EDWARD M. BUCKINGHAM, M.D. .. 218
MEMORIAL RESOLUTIONS FOR CHARLES F. WITHINGTON, M.D. .. 218

CORRESPONDENCE

THE TREATMENT OF IMPACTED HIP FRACTURES. *Royal Whitman, M.D.* 219
LONDON WAR HOSPITALS. *Henry Viets* 222
PENNSYLVANIA CONFERENCE OF PHYSICIANS. *John Price Jackson*. 224

MISCELLANY

MASSACHUSETTS STATE DEPARTMENT OF HEALTH. RÉSUMÉ OF COMMUNICABLE DISEASES 218
NOTICES, RECENT DEATHS, ETC. 224

Address.

THE PRINCIPLES UNDERLYING THE SURGERY OF THE PANCREAS.[*]

BY JOHN B. DEAVER, M.D., PHILADELPHIA.

"THERE is an immense amount of sepsis in medicine." These words of an eminent clinician convey an appreciation of the preponderating rôle played by infection in the production of pathology. The effects of infection are often obscure and far reaching, for they are indirect as well as direct, manifesting themselves at a distance as well as at the primary site, revealing their ravages at a time remote as well as immediately, and it is not too much to say that if we could attain the ambitious ideal of Pasteur of causing all the infectious diseases to disappear from the earth, that along with the so-called infectious diseases would go such a large proportion of diseased conditions, now but little considered in this connection, that our works on pathology could be condensed into the size of a primer and our occupation would be all but gone.

"Still, it is our chief task to unravel the devious ways of infective disorders, since it is only by a thorough understanding of their etiology, clinical course and effects, that we may hope to palliate or cure and ultimately to prevent them. For this reason we offer this brief suggestion as to the origin of certain pancreatic swellings and inflammations."

Barely thirty years ago there was born in this city, which has often served as the cradle of liberty, light and progress, a clinical infant. The great Reginald Fitz was the midwife. Socrates was fond of calling himself a midwife because, he said, he brought other men's ideas into the world. Medicine had been in prolonged travail. Claessen (1842), Ancelet (1866) and Friedreich (1875) had collected and described, as systematically as was then possible, the diseases of the pancreas; Rokitansky (1863) and Klebs (1869) had described with accuracy certain hemorrhagic conditions of the pancreas found at autopsy. Balser (1882) had published observations on small, opaque white areas in the abdominal fat which he proved to consist of necrotic fat cells and believed to be a cause of death. It remained for Fitz in 1889 with exact observation and creative coördination to discern the significance of these fetal movements and skilfully to deliver the infant entity of pancreatitis. It is not, therefore, without some hesitation that I venture to speak of the growth of this prodigy within the confines of his native heath. And I hasten to confess that his development, which has been a matter of labor and concern for the world at large, has not yet reached the point of maturity or perfection.

The striking lesions of acute pancreatitis and the opportunities of observation in vivo by rapid advances in abdominal surgery led to the accumulation of considerable clinical data. From the animal laboratory there issued numerous contributions dealing with the etiology of acute hemorrhagic pancreatitis. Lesions more or less similar to the clinical condition could be produced, it was found, by a variety of methods, such as direct trauma, interference with the blood supply, and the introduction of a variety of substances into the tissues of the pancreas or into its ducts.

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[*] Read before the Boston Medical Library, in conjunction with the Suffolk District Medical Society, Boston, Nov. 22, 1916.

Bacteriological investigation, which had yielded such rich results in the explanation of inflammations of other organs, in pancreatitis remains negative or inconclusive.

The first suggestion of a method by which acute pancreatitis could be caused by clinical conditions was made by Opie in 1901. Opie found a small gallstone impacted in the papilla of Vater in a case of acute hemorrhagic pancreatitis. It has been known for many years that the common bile duct and the duct of Wirsung usually open into the ampulla of Vater, and their mingled secretions are poured into the duodenum through the single opening at the summit of the papilla of Vater. Opie showed that in certain cases the arrangement of the ducts was such that the occlusion of the papilla of Vater by a small gallstone would throw the ducts of the pancreas and the liver into direct communication through the medium of the ampulla of Vater. Thus a mechanism was presented for the retrojection of bile into the ducts of the pancreas, and experimentally Flexner and others showed that the effect of the injection of bile into the duct of Wirsung in animals actually caused acute hemorrhagic pancreatitis. It was noted, furthermore, that gallstones were associated with acute pancreatitis in the human subject in a large percentage of cases varying from 42% to 100% in various series reported.

This observation and the stimulus to experimental work to which it gave rise, centered the attention of investigators upon the ducts of the pancreas, and the explanation of the disorders of the organ resolved itself to the very simple one of ascending duct infection or chemical insult due to regurgitated bile or duodenal contents. The substances that have been shown to produce acute hemorrhagic pancreatitis when injected more or less forcibly into the ducts of the pancreas comprise bile, the isolated salts of the bile acids, taurocholic acid and glycocholic acid, various oils, hydrochloric acid and intestinal secretions, intestinal secretions and activated pancreatic juice, commercial trypsin, calcium and sodium chloride, papain, adrenalin, sulphuric acid, chromic acid, formalin, soda, bacterial extracts and still other substances of such extraordinary variety, that no common chemical property is possessed by them. But these were not the only methods by which this extraordinary lesion could be reproduced. Artificial ischemia by pressure or temporary ligature, mass ligation and gross injury to the pancreas, and the injection of occluding substances into the pancreatic vessels such as air, paraffin, wax, lycopodium and oil—all could be made to cause the typical lesions. Furthermore, it was found, as in an experiment by Sweet, that the typical systemic intoxication, fat necrosis, and death could be produced by inserting into the abdominal cavity of a normal animal a portion of the sterile pancreas removed from a second animal under aseptic precautions. To the syndrome thus produced, the Germans gave the name "pancreasvergiftung" (pancreatic poisoning). It is clear that the essential features common to this condition of acute pancreatitis, do not depend upon the substances or methods shown to produce it either under experimental or clinical conditions, nor yet to the route or method of their application, but to something resident in, and inherent to the pancreas. We have finally reached the point where those most thoroughly acquainted with the development of our knowledge of the subject agree that the most essential features of acute hemorrhagic pancreatitis are due to the digestive activities of the pancreatic ferments themselves. Fat necrosis is merely an evidence in vivo of the fat-splitting property of the ferment lipase. Hemorrhage, gangrene and systemic intoxication are due chiefly to the activities of the proteolytic enzyme trypsin and the absorption of poisonous products of protein change. Now, as the proteolytic ferment exists in the pancreas, only in the form of the inactive protrypsin, which is incapable of acting upon the tissues, the problem becomes one of determining upon what conditions this activation in vivo depends. The retrojection of bile, according to the explanation of Opie, remained the only explanation that squared with clinical conditions. However, not all cases of hemorrhagic pancreatitis are also the subject of gallstones. Polya found that infected bile was more potent in reproducing the disease than sterile bile. Delezenne and Hekma have shown that an activating substance is present in many varieties of bacteria. It is known that simple autolysis of the dead pancreatic tissue is able to activate the contained ferments. Moreover, if gallstones are present in the majority of cases of acute pancreatitis, is it necessary that they act according to the mechanism of Opie, or may they not be the cause of recurring exacerbations of infection which, communicated to the pancreas, may start in motion the hemorrhage, autolysis and ferment activities characteristic of the disease?

Coincident with the more recent work on the acute pancreatic conditions, chronic pancreatitis began to claim the attention of surgeons. The numerous instances of enlargement of the head of the pancreas observed during operation upon the biliary passages soon proved that this association was more than a casual one. Mayo Robson deserves the greatest credit for insisting upon the frequency and importance of the condition. At first the attempt was made to explain the infection of the pancreas by the same method as was then current in connection with the acute disease, namely, by duct transmission. But it was observed that, as a rule, only the head, and especially the upper portion of the head of the pancreas, was affected. The body and tail usually escaped. It is more than passing strange that a duct-borne infection should involve only a small portion of the duct distribution. Between 1904 and 1907 Bartels published his work on the anatomy of the lymphatics of the pancreas in which he showed the close association of the lymphatics of the duodenum and pancreas. Franke (1911) showed that the lymphatics of the gall-bladder coursed immediately beneath the posterior surface of the upper portion of the head of the pancreas. Deaver and Pfeiffer from clinical observations showed that the course of infection could often be demonstrated in vivo, beginning with the gall-bladder which gave rise to lymphangitis and lymphadenitis along the course of the common duct with its accompanying lymphatics in the right free border of the gastro-hepatic omentum and finally peripancreatic lymphangitis and lymphadenitis with swelling and induration of the adjacent portion of the pancreas. Arnsperger suggested that the condition should properly be called pancreatic lymphangitis. Franke finally succeeded in injecting the lymphatics of the upper portion of the head of the pancreas from the gall-bladder.

Here the matter stands. Complete experimental proof as yet is lacking, owing to the complexity of the factors involved, including the varieties of bacteria, the selective affinities and toxicity of each, the general and local individual resistance and certain mechanical factors. But we believe that pancreatitis is, with few exceptions, an infective disorder, propagated in the majority of instances from those frequent foci of upper abdominal infection, the duodenum and the gall-bladder; that the infection arrives usually by way of the lymphatics; that acute pancreatitis is usually infection plus ferment activity, though it may be traumatic or chemical in exceptional cases; that the most common form of chronic pancreatitis, as seen by the surgeon, begins as a pancreatic lymphangitis depending for its origin and often for its continuance upon a primary infected focus in the neighborhood.

These conceptions have a profound influence upon the treatment of both acute and chronic pancreatitis.

Since Fitz called attention to the more striking pictures of pancreatic disease we have learned that here, as elsewhere in the body, disease processes vary greatly in extent, kind and severity. Fitz very properly pointed out that the usual sequence of affairs is hemorrhagic pancreatitis, then gangrene and finally suppuration. We now know that very acute inflammation of the pancreas may be unaccompanied by hemorrhage, or that per contra the hemorrhage may be an initial and profuse affair infiltrating not only the pancreas but also the surrounding cellular tissues and omenta and staining the fluid exudate which collects within the peritoneal cavity. On the other hand, hemorrhage may be focal, causing one or more spots of hemorrhagic softening in the head or less commonly in the tail of the organ. Suppurative processes may go on without previous hemorrhage or gangrene. I have several times encountered simple purulent collections in the head of the pancreas and Dr. Pfeiffer has related to me a case observed post-mortem in which a small gallstone was found impacted in the summit of the papilla of Vater, the pancreas being the seat of numerous small focal abscesses without evidence of previous hemorrhage and no areas of gangrene. The patient had died suddenly in a medical ward, the chief symptom having been persistent hiccough. Doubtless more upper abdominal seizures than we now suspect are in reality instances of acute pancreatitis of lower grade than the classical hemorrhagic disease.

To understand the procedures which are of use in pancreatic surgery, we must be able to answer several questions: (1) what may we aim and legitimately hope to accomplish by operation? (2) when should we operate? (3) how should we operate?

It is obvious that complete or partial removal of the acutely inflamed pancreas is out of the question. Our measures must therefore be directed at the cause of the condition if it can be discovered and is still capable of acting, and secondly, to come to the relief of the process already inaugurated by instituting appropriate drainage. It is in connection with the first consideration, what may we aim and legitimately hope to accomplish by operation, that our conceptions of the cause of pancreatitis are of the first importance. Acute pancreatitis is one of the most agonizing affections known to mankind. The pain is shocking in intensity and persistent. The toxemia, characteristic of the condition, begins soon to deplete the vital powers of the patient. It is manifestly improper to do more in an operative way than promise to contribute to the immediate recovery. There are cases in which nothing more can be done than rapid section and hasty drainage. These are the forlorn hopes of surgery and these procedures are to be regarded as born of necessity rather than of intelligent choice.

My distinguished friend, our late colleague, Dr. Maurice H. Richardson, made the statement in discussing the subject of acute pancreatitis before the Clinical Congress of Surgeons of North America, that he had never seen a case of acute hemorrhagic pancreatitis recover.

Excluding such moribund risks it becomes necessary to decide whether it is advisable to attack the pancreas alone or to deal also with associated lesions. We have seen in experiment that the pancreas may in a moment receive a lesion that will set up the full train of hemorrhage, gangrene and suppuration, proceeding to a fatal termination even after the cause has ceased to act and clinical evidence indicates that in the so-called ultra-acute cases we may have a similar state of affairs. These also will usually be the desperate cases in which there is no opportunity for operations of choice. On the other hand, there are cases of less severity in which it can scarcely be of no moment that the etiological factor be unrelieved. In such cases there is time for simple procedures that are not shocking in character, and since the biliary tract, according to our conception, is usually at fault, it is indicated to relieve the gall-bladder or ducts of stones, if present, and to drain if any indication of infection exists whether or not calculus can be detected. We have performed cholecystostomy in 11 cases with 3 deaths, cholecystostomy and choledochostomy in 2 cases, both of whom recovered, and of 3 cases in which the bile tract was untouched two died and one recovered. One case collapsed and died on the table before anything but the abdominal incision had been made. We have not been able to attribute any of the deaths to the operations upon the bile passages. On the contrary, we ascribe to these procedures a beneficial influence particularly in view of the fact that the mortality in this series is lower than that of any series of equal size with which we are familiar. We do not advocate cholecystectomy in this condition because it is more time-consuming and subject to operative difficulties and complications. Moreover, the gall-bladder is the most accessible and satisfactory portion of the biliary tract for drainage which is sufficient in dealing with infections of the bile passages for the time being. We may remark in passing, that recurrences of infections of the bile tract are more common in our experience when the gall-bladder has been simply drained than when it has been removed. But we stick here to our contention of doing no more than will promise immediate results and letting the future take care of itself, on the principle that two operations on a living patient are better than one thorough operation and a dead one. The common duct should be opened only when stones are detected. If opened, a probe should be passed down into the duodenum to insure a patulous condition of the papilla of Vater. But it is inadvisable to open the common duct with the idea that it is necessary to dislodge a fancied stone impacted in the papilla, since this hope as a rule will prove illusive. If the measures just outlined are advisable, it is also certain that the time to operate is at the earliest moment consistent with the condition of the patient as an operative risk. Collective statistics by Körte and others show beyond a doubt the valuable influence of early operation. Nothing but profound shock should warrant delay, and this should be combated by saline infusions, adrenalin and pituitrin in order to bring the patient's condition as speedily as possible to a point where operation can be endured.

It is not only because of the preventive character of the drainage of the biliary tract that early operation is necessary, but equally or even more so because of the hope of interrupting the extravasation of blood and ferments into the pancreas and the surrounding tissues. There is no doubt that free drainage is a desideratum. When it comes to specifying to what extent the pancreas may be punctured, scarified or incised there is still room for experience to guide us. We do not practice free and indiscriminate incision into the swollen pancreas because of the difficulty of controlling the free hemorrhage that is likely to result. The peritoneum over the organ should be scarified so that gauze drainage may be brought into direct contact with the surface. This also opens up the retro-peritoneal space and aids in preventing accumulations about the pancreas. A few blunt punctures are also serviceable. When a localized point of marked swelling is encountered it is often difficult to elicit fluctuation, but a large aspirating needle on a syringe will detect collections of fluid and these should be opened freely.

If the disease has been allowed to go unoperated for a number of days a peripancreatic collection of considerable size may localize and be perceptible through the parietes. Often such collections form in the lesser omental sac and point in the left loin where they may most advantageously be evacuated. One such case I (J.B.D.) have operated in which the diagnosis was made by Fitz himself. The patient recovered after losing a large portion of his pancreas as a gangrenous slough. He remained well for a time (six years), but eventually died of diabetes, doubtless secondary to the pancreatic disease. Very rarely a similar abscess may originate in the head of the pancreas and point retroperitoneally in the right loin. We have not met with such a case. Abscesses which present anteriorly rarely adhere to the parietal peritoneum, being covered by one or more viscera or omenta. Such collections must be evacuated transperitoneally. It is sometimes possible and advisable to do this by a two-stage operation, closing off the general cavity before incising the collection. More often evacuation must be done at once, first protecting the peritoneum from soiling, and introducing sufficient drainage.

The sinuses resulting from the drainage of acute pancreatic inflammations are at times very troublesome. The effect of the pancreatic ferments upon tissues is evident in the intense irritation of the skin in contact with the discharge and by the sluggish formation of granulations which are constantly subject to the severe erosive action. A strict antidiabetic diet, as proposed by Wohlgemuth, is of service in reducing the activity of the pancreas, thereby favoring healing. In all cases the skin should be protected at once by a bland, heavy ointment to prevent contact with the secretions. After excoriation has occurred it is practically impossible to get anything to stick to the moist surface.

Polish woman, married, age 24 years; admitted to the German Hospital, 11-5-'16. Was perfectly well until two days before admission, when she was seized with most acute abdominal pain followed by vomiting. Upon admission abdomen greatly distended, rigid and universally tender; tenderness, however, more pronounced two inches above the umbilicus and immediately to the right of the median line.

Tentative Diagnosis. Acute appendicitis with diffuse peritonitis.

Patient sat up in bed, ice to abdomen, and given anatomic and physiologic rest. Improvement gradually ensued until at the end of three days there was restoration of peristalsis as determined by auscultation of abdomen, the patient was not passing gas voluntarily; belly walls relaxing below, but remained rigid above. Two days later an area of dullness extending from mid-line well to the left and downward to the umbilicus. At this time I had a cystoscopic examination with catheterization of the ureters, which proved negative; also x-ray with negative findings, except the presence of a diffuse shadow at the site above mentioned. Diagnosis now pancreatitis with effusion.

Operation. Diffuse fat necrosis. Stomach pushed well up into extreme upper abdomen, gastro-colic omentum between the stomach and transverse colon greatly infiltrated and bulging forward, palpation showed fluctuation at latter point. Incision evacuated large amount of pus and bloody fluid from lesser omental sac. Two long, good-sized rubber drainage tubes introduced into the cavity; the cavity was lightly packed with three pieces of gauze one yard long and a foot wide, each. It is now a week since the operation and patient has had no untoward symptom.

In the ultra-acute cases immediate intervention before the oncoming peritonitis. Acute diffuse peritonitis, the result of ultra-acute pancreatitis presents the worst form of the acute abdomen. In the presence of so desperate a condition I have thought it wise in a few instances to defer operation until the peritonitic process became limited; this has been accomplished by the observance of strict anatomic and physiologic rest, by which we understand the patient occupying the extreme sitting position, absolutely nothing by mouth, salt solution (Murphy method), by bowel, lavage if there is vomiting, as is usually the case, and morphia hypodermically to relieve pain.

In all abdominal conditions I try to give as little morphia as will produce comfort and in as small doses as possible. The abdomen is practically packed in ice. Expressed beef juice and whiskey frequently are added to the saline solution. I may say, strict observance of anatomic and physiologic rest will often be all that is required to produce comfort. I know this opinion is directly antagonistic to that of several eminent surgeons, yet I am so thoroughly convinced of its correctness that I can make no modification of this rule.

In the milder cases of acute pancreatitis, not seen until the advent of a diffused or very active localizing or localized peritonitis, I take advantage of the great good accomplished by anatomic and physiologic rest until sure as one can be that the process is a limited one. The question arises, does not this favor suppuration, also does it not favor partial resolution and at least some absorption?

Whether we regard chronic infective pancreatitis as a surgical disease will depend upon our acceptance of the general belief that, as a rule, it is secondary to infective disease of associated organs. For there is nothing that we can do in the way of direct attack upon the pancreas that will promise relief. In the cases, relatively rare, of obstruction of the common bile duct by the swollen or indurated pancreas at the point where the duct tunnels the retro-duodenal portion of the head, as it does in two-thirds of all cases, it is manifestly proper to perform a short-circuiting operation in order that the bile may be conducted into the intestine. This is best effected by an anastomosis between the gall bladder and the duodenum. In case of doubt as to the feasibility of this operation the stomach may be used, or failing this, the intestine. If the gall bladder has been removed or is too much diseased the common duct must be implanted into the duodenum. But these are operations not for chronic pancreatitis per se but for the consequences of chronic pancreatitis. When the pancreas has reached the stage of induration with deposits of fibrous tissue between the acini or lobules, with atrophy of the parenchyma, cure is no more to be thought of than in contracted kidney. The damage is done and nothing remains but palliation.

But it is our belief that in some instances at least these end results are inaugurated by the conditions observed in vivo by the surgeon. The internist must appreciate therefore that in exposing his patient to the action of persistent and recurring attacks of upper abdominal infection due to ulcer, gallstones, cholecystitis and cholangitis he is accepting a chance of irremediable damage to the pancreas. Experience has shown that pancreatitis, which is associated with gall-bladder disease, if operation is an early one, disappears rapidly after cure of the infection. I personally believe, and have no hesitancy in expressing myself to the effect that gallstone disease, embracing as it does, of course, infection of the gall-bladder, liver and common duct, begets conditions of the pancreas often more serious than the primary condition, therefore it is my firm belief that gall-bladder infection should not be allowed to recur, but be operated during the first attack or as soon as the patient recovers from same. I feel reasonably sure that if this course was adopted there would be fewer cases of pancreatic lymphangitis, chronic pancreatitis, to say nothing of diabetes. I fear that a serious obstacle is arising in the shape of wanting to verify stone diagnosis by x-ray, the findings of which being negative the patient will go without operation. I say to my patients not to be x-rayed because if x-ray is negative they may be influenced not to be operated upon, and as my ideas are so strong in this matter, I want them to accept operation at once. Therefore nothing is to be gained, but financial loss, by being x-rayed.

The surgical treatment of chronic pancreatitis resolves itself, therefore, into a question of the best operative treatment of the disease of the biliary tract which is found at operation. Recent bacteriological work has demonstrated what clinical and pathological evidence had long since indicated, that every infection of the gall-bladder is an interstitial infection. This work has emphasized, however, the essentially chronic and persistent nature of such infections. Our experience with recurrence of symptoms after operation upon the gall-bladder, as previously mentioned, is also, that recurrence is more apt to follow when the gall-bladder is left than when it is removed. We incline therefore to cholecystectomy. If there is any evidence of obstruction of the common duct, gall-bladder drainage for an indefinite time or cholecystoduodenostomy are the operations of choice. The latter operations should be undertaken only by the experienced and after careful survey has shown that tissues are satisfactory and union can be effected without tension.

In case of doubt we leave the gall-bladder and sew it to the parietal peritoneum, marsupializing it, in order to provide for prolonged drainage, which alone is efficient in eradicating infection. Common duct drainage is not so satisfactory owing to the liability, fortunately not great, of subsequent stricture.

We may remark in passing that we have almost despaired of diagnosing with any degree of certainty the milder grades of pancreatic infection. Functional tests are not available until the pancreas has suffered considerable damage, if then. The organ possesses a large margin of safety. Even in pronounced cases of pancreatic involvement we have found no evidence of functional derangement. Possibly tests will at some time be devised to give us this information, but of this we are certain that they do not exist now. In a former series of cases of chronic pancreatitis we found 6% showing transient traces of sugar in the urine. In our last series of 64 cases there was not a single instance of glycosuria. The stools show no evidence of pancreatic insufficiency in the early cases. The ferment tests are absolutely useless. The diagnosis is a clinical inference based on the fact that pancreatic disease is associated with biliary disease in at least ten per cent., and sometimes as high as thirty per cent. of all cases. It is more often present in long-standing disease than in cases of short duration, and more commonly with common duct involvement than in purely cholecystic inflammations. Rarely, very rarely, the enlarged head of the pancreas can be palpated, and at times persistent and marked tenderness can be elicited by deep pressure over the organ. Pain piercing straight through to the lower thoracic or lumbar region is significant and in involvement of the body of the pancreas pain and tenderness may extend transversely across to the left. But all signs may be absent and all rules violated. The diagnosis of chronic pancreatitis in its early stages remains the diagnosis of associated lesions and their treatment in the main constitutes its surgery.

Finally, we should think more often of this organ which is the most important gland of digestion and an essential part of the great endocrine system. We should include it in our plan and rationale of treatment of abdominal disease, and we should neglect no opportunity to add to our knowledge concerning it.

Original Articles.

THE SENSORY EVIDENCE OF NERVE REGENERATION.

By Isador H. Coriat, M.D., Boston,

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In a previous communication on this subject, it was demonstrated that the sensory regeneration of a peripheral nerve was selective in character.[1] It was shown that during the process of nerve regeneration in an ulnar nerve lesion, isolated pain points could be demonstrated in an otherwise completely analgesic area, thus proving that the specific sensory receptors for pain (protopathic system) were not only an independent system, but were also more capable of rapid regeneration than the specific receptors for touch.

The conclusion drawn from a study of this case, was the independence of the nerve supply of the skin for specific afferent receptors during the process of nerve regeneration. The specific nerve-endings for touch had completely disappeared and had not begun to regenerate, while the specific receptors for pain were in a stage of very active, in fact it might be said, of overactive regeneration. The findings in this case thus harmonized with the physiological investigations of von Frey and Goldscheider and with the clinical observations of Head and Sherren, although more stress was laid upon the independence of the regenerating systems.

Since this paper was written, the investigation on sensory regeneration has been carried still further, with the result that the findings as given there have not only been confirmed in other cases of nerve regeneration, but have received additional corroboration through histological, as well as clinical, evidence.

A further investigation of the case of this ulnar nerve lesion was undertaken four months later, with the following results: The formerly complete anesthetic zone had completely disappeared and light touch was distinctly felt in this area. In this area, also, pain and tingling to light touch with cotton wool and with the camel's hair brush, could be demonstrated. With von Frey's hair esthesiometer, a large increase of pain points could be made out, in an area where several months previously the pain points could be demonstrated only in isolated groups. As will be shown later, this gradual increase of specific pain receptors on the skin furnishes the best evidence of an active and uninterrupted nerve regeneration.

The entire question of nerve regeneration is an interesting one, both from the academic and practical standpoints, since in cases of primary and secondary nerve suture, it is of the utmost importance to have conclusive evidence which will determine the rapidity and success of nerve regeneration. The question is one which presents considerable difficulties, since in the regeneration of a nerve, there is influenced, not only the sensory field innervated by a specific nerve, but likewise the question of motility, the trophic changes as shown by the muscular atrophy, and finally the changes in electrical reaction. All of these data have to be taken into consideration in determining whether the nerve is successfully regenerating, but all of these, the changes in the sensory field are undoubtedly of the most importance, since through the changes in sensation, we are furnished with the best evidence of the highly complex process of regeneration. In recent years, these changes in sensation have attracted considerable attention, as both the quantitative and qualitative changes in the sensory field seem to run parallel with the active regenerating processes in the nerve itself.

Up to the time of the work of Head, on the consequences of injury to the peripheral nerves of man, and his famous human experiment on nerve division,[2] the data for such sensory evidence was based upon a more or less crude and haphazard method of testing sensation. It was demonstrated, through the work of Head, that the best evidence for nerve regeneration could be found, not so much upon the nature of the electrical reactions, or on the slow regain of muscle strength and tone, but rather upon a close study of the changes in the sensation of the skin over the area supplied by a specific nerve.

It was shown that the nerve supply to the skin is subserved by two anatomically distinct peripheral systems, *i.e.*, the protopathic or pain receptors, and the epicritic or touch receptors. These systems regenerate at different periods, the epicritic consuming nearly twice the time to regenerate as compared with the protopathic, probably because the latter is a more primitive type of sensation, while the former is of later evolutionary form, and is a more refined sort of discrimination. This selective function of the receptors can be best seen in the specific energy of the various sense organs. These independent sensory receptors can be demonstrated through careful methods of testing, and offer the best evidence at our command of the successful suture of a peripheral nerve.

My own investigations have, however, been carried somewhat further, and it has been possible to demonstrate that these independently regenerating systems can be best verified through the increase of peripheral pain points, or in other words, through the protopathic system. However, through a fortunate opportunity, it has been possible, after a secondary suture, to examine a nerve histologically, and thus compare it with the clinical evidence of partial regeneration at an examination before the secondary suture.

The careful work of Ballance and Stewart[3] has considerably modified the viewpoint on the histological mechanism of nerve regeneration, both in the end bulb and in the distal segments. The neurillema cells assume an active function and produce short lengths of axis cylinders and medullary sheaths, and these, linking themselves together in chains, form continuous axis cylinders and medullary sheaths. Their histological investigations demonstrate that new axis cylinders and medullary sheaths appear between the fourth and fifth week of regeneration, after which date they rapidly increase in size. These never attain full maturity, but remain in an embryonic stage, unless the distal segment is subsequently joined by sutures to the proximal. Evidently some stimulus afforded by the conduction of impulses is necessary in order to permit of the full development of the medullary sheaths and axis cylinders.

From a practical standpoint, this stimulus is afforded by the use of electricity. This partial regeneration, when the proximal and distal segments were not joined, or when the impulses or the anatomical continuity was blocked by scar tissue, was well demonstrated in our first case. In this case, too, after a secondary suture, in which the blocking was removed, the clinical evidence of a rapid regeneration, as compared with the former arrested regeneration, could be easily demonstrated.

Bethe[4] has shown, in his investigation of the nature of nerve conduction, that electricity in the form of the constant (galvanic) current affects the axis cylinders in actually producing an increase in nerve energy. The various aspects of the inquiries into the nature of electrotonus also confirms these observations of

Bethe, since it has been shown that the galvanic current produces an internal change in the excitability of a nerve, so that in the vicinity of the cathode there is a condition of increased excitability, and in the vicinity of the anode a condition of decreased excitability. It is in this condition of electrotonus in the nerve structures which probably explains the character of the electrical formula in both normal and degenerated nerves.

In the normal nerve the increased excitability of the cathode and the decrease in the anode corresponds to the formula of the normal galvanic reaction (An CC<Ca CC), while in a completely degenerated nerve structure, the opposite is found. This change of excitability or electrotonus persists during the entire time of the flow of the current through the nerve. Now a nerve fixed and stained after the manner of Bethe, gives histological evidence of this change of electrotonus, in that the anode is completely colorless, while the cathode shows a substantially darker coloring of the axis cylinders.* This change takes place only in living nerve structures, and is, therefore, evidently a functional process essential to the transmission of nerve impulses.

According to Ballance and Stewart, the true source of regenerative processes in the peripheral nerves is found in the neurillema cells of the nerve trunk itself, and not in the anterior horn cells or the posterior root ganglia. Structural regeneration of axis cylinders has never been observed in the central nervous system in cases of experimental hemi-section of the spinal cord, even although the cut ends were left in close apposition, whereas apposition alone can produce regeneration in peripheral nerves. More recent investigations,† however, have shown, that a certain minimal amount of regeneration may take place in the spinal cord, but not to the extent which it does in the peripheral nervous system. For all practical purposes, therefore, it can be stated, that although regeneration occurs only to a very limited extent in the central nervous system, yet certain phenomena of restitution or compensation of function can often be demonstrated in lesions of the central nervous system (Anton[5]). In a study of some spinal cord lesions,[6] it was pointed out that recovery of function can take place only if the compression has not proceeded to the point of producing irreparable degeneration and the formation of sclerotic tissue.

Kennedy[7] has arrived at essentially the same conclusions on nerve regeneration as Ballance and Stewart, namely, that young nerve fibres originate from the protoplasm within the old sheath of Schwann.

In some cases, however, as in the case of suture of the musculo-spiral nerve reported by Dawbarn and Byrne,[8] the sensory evidences of regeneration took place in an unusual order, light touch appearing before the other forms of sensation. They concluded that this was due, partly to the operative procedure and partly to the anatomical peculiarities of nerve supply rather than to an unusual form of sensory regeneration.

In two of our own cases (Cases 2 and 3) of injury to the median nerve, the pain points appeared very rapidly without scarcely any trace of epicritic disturbance, while in another case (Case 5), there was a reversal of sensory regeneration, in that at one place the protopathic area overlapped the epicritic. Observations such as these, which will be given more in detail in the case records, demonstrate that sensory regeneration may take place in an unusual order, and is not dependent on the physical condition of the nerve suture.

In order to be of any value, the sensory investigation must be carefully done, particularly if there be a secondary suture of a nerve or a nerve transplantation. In these cases, sensation must be minutely investigated both before the operation and at varying periods after it, until it is found to be normal, because the sensory changes offer the most satisfactory evidence of the rapidity and success of the nerve regeneration, far more so than the return of motor power or the changes in the electrical reactions. As an example of how the value of otherwise careful work may be minimized through neglect of this important factor of sensory investigation, we may refer to some of the observations of Ballance and Stewart.‡ In one of their cases, for instance, after the external saphenous nerve had been severed by a bullet, the only record of sensory disturbance is that "anesthesia resulted in the corresponding area of the skin, in the outer aspect of the foot." No further data are given, although a nerve transplantation was done ten months later, and in the section recovered at operation, numerous regenerating axis cylinders were demonstrated in both the proximal and distal segments. In spite of this, no further sensory examinations were made to demonstrate the clinical evidences of nerve regeneration.

If one compares this paucity of clinical observation with the careful work on sensory regeneration of Head, Rivers and Sherren, it will be seen that the latter, although consuming more time, is of the utmost practical value concerning the success or non-success of nerve regeneration. Our observations in a way confirm these experiments, although we have insisted that the best evidence of sensory regeneration, and at the same time showing the independence of the peripheral sensory systems, is the demonstration of pain points, both with the needle and hair esthesiometer in the midst of an otherwise completely analgesic area. In one of our cases, a histological examination confirmed these clinical evidences of nerve regeneration.

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* See figures 70 to 73 inclusive and the photographs in Bethe's book.

† See the various publications of Schmaus, Perrero, Rossi, Bielschowsky and Fickler.

‡ See particularly observation 41-A.

The anatomically distinct protopathic and epicritic systems regenerate at different periods after nerve suture. Thus two distinct groups of sensory impulses may be set free by the end organs in the skin.

Head's case[9] of a human experiment in nerve division is perhaps the most accurate and elaborate investigation ever undertaken on the sensory disturbances as they occur in nerve regeneration. The radial and external cutaneous nerves on Head's left arm were divided and sutured, and the return of cutaneous sensibility studied for nearly two years under the most accurate conditions, until normal sensation had been entirely restored. At varying periods after the suture, pain sensation was gradually recovered in the midst of an area otherwise completely analgesic, while the area for light touch remained unaffected for a long period, thus corresponding to our investigation of the gradual regeneration of peripheral pain receptors.

In both Head's investigations and my own, the response to pain, either with the needle or the hair esthesiometer, was found to be much greater than when pain points were stimulated with these same instruments over an unaffected portion of the body. This vivid response of protopathic sensibility to painful stimuli was probably due to the hyperactivity of the newly regenerating receptors for pain, since also, the pain sensation during the procedure of testing sometimes irradiated over the abnormal area into normal parts. According to von Frey, protopathic sensibility is due to an abnormal state of the injured nerve, but since protopathic receptors have been found in the normal glans penis, such a viewpoint must be abandoned. Also, as pointed out in my former contribution,[10] Dejerine,[11] rather questionably it would seem, is inclined to interpret the occurrence of irradiation and painful points during the process of nerve repair, rather on the basis of neuroma formation in the peripheral stump, than as an evidence of selective sensory regeneration.

The following method of sensory investigation was uniformly carried out in all the cases. Sensation was carefully tested while the patient was in a quiet, relaxed condition, free from disturbing external stimuli. For pain the needle esthesiometer was used; for light touch either cotton wool or a camel's hair brush, while for the regenerating pain points the best results were secured either with the needle esthesiometer or with von Frey's hair esthesiometer, in varying lengths of from 10 mm. to 40 mm. By means of this latter instrument, it was possible to keep a serial detailed record of the sensitiveness and distribution of the regenerating pain points. The sensory field was mapped out directly by means of colored pencils, blue for epicritic and red for protopathic and for the pain points. This was then made a permanent record for the purpose of comparison with later examinations by tracing the sensory field on transparent paper.

The following detailed reports of cases are(§) in order to demonstrate the various changes in the sensory field at different stages of nerve regeneration.

Case 1. A young man of 20, on July 5, 1913, accidentally cut his wrist with a glass bottle, severing the tendons, nerve and artery. The injured structures were sutured the same day. Immediately after the injury, there was noticed a sensation of numbness over the palmar distribution of the median nerve. The sensory disturbances persisted, and in addition, increasing weakness of the thumb, index and middle fingers was noted, making it very difficult to hold a pen or pencil in writing for any length of time. An examination on January 25, 1916, disclosed the following condition:

Sensation. The area for disturbed epicritic sensation involved a portion of the median nerve distribution, and within this area protopathic sensibility was also greatly disturbed (complete analgesia). In two portions of the area of disturbed epicritic sensation, where there is complete anesthesia to cotton wool and to camel's hair brush, a large number of pain points can be demonstrated with both the needle esthesiometer and with von Frey's hair esthesiometer at 10 mm. length. Stimulation of some of these pain points with the hair esthesiometer produced painful irradiation to the tips of the middle and ring fingers. In the area of disturbed epicritic sensation, there was also inability to distinguish and correctly discriminate two blunt compass points 1 cm. apart, except in the region where the pain points were crowded together. In this latter place the discrimination was not disturbed, probably due to a fusion of the two sensations through a physiologic irradiation. (See Fig. 1.*)

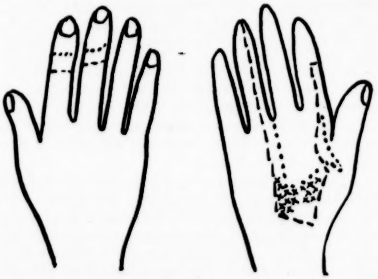

Fig. 1.

This same phenomenon was pointed out as occurring in my study of the ulnar nerve lesion previously referred to. It corresponds to an overflow of reflex action into channels belonging primarily to other reflex arcs, as pointed out by Sherrington.[12]

§ Case 1 was referred by Dr. Albert Ehrenfried, Cases 2 and 4 by Dr. Otto Hermann, Case 3 by Dr. Alice Gray, Case 5 by Dr. L. S. McQuade.

* The legends of all the figures are uniform: dashes for epicritic sensation, dots for protopathic, and crosses for the pain points.

This irradiation from two blunt stimuli is probably due to an increase in the sensibility threshold of the peripheral pain receptors, as during the process of regeneration, there is actually a hyperactivity of these newly regenerating pain receptors, as shown by the large number of pain points which can be demonstrated with the hair esthesiometer.

Motility. There could also be demonstrated motor weakness of the middle finger, and of abduction of the first metacarpal and of flexion of the hand, while the terminal phalanx of the thumb was fairly strong.

Trophic Disturbances. The thumb and middle ring fingers were moist and glossy. In the area of median innervation the nails were brittle. There was moderate atrophy of the abductor pollicis brevis and of the opponens pollicis.

Electrical Reactions. The thumb muscles showed a slightly diminished reaction to faradism, while to the galvanic current, the reaction was slowed, but without polar inversion (An CC<Ca CC).

On the basis of this examination a diagnosis of incomplete regeneration of the median nerve was made, taking into consideration the long period which had elapsed between the time of injury and the examination detailed above, particular stress being laid upon the investigation of the sensory disturbances. A secondary suture of the median nerve was advised. On Feb. 9, 1916, this operation was done by Dr. Ehrenfried.

Operation. An incision was made on anterior surface of forearm, from the middle of forearm down to below annular ligament, excising the old scar tissue. On separating the muscles at the middle of the forearm, the median nerve was found and traced downward. It was discovered to terminate proximal to the annular ligament in a bulbous enlargement. For the purpose of getting a fresh surface for suturing, the neuroma on the extremity of the proximal segment was excised. In order to bridge the gap of about 1.5 cm., which now existed between the two segments, a plastic flap was turned down from the proximal segment and sutured to the distal segment with silk. The deep structures were sewed together to cover the anastomosis, and fascia and skin were united in the regular way. Hand put up in flexion on a wire splint. The wound healed by first intention.

The pathological diagnosis of the excised tissue was amputation neuroma. There was found a large number of nerve bundles going into a mass of scar tissue, with regenerating myelin sheaths and neurilemma cells.

After staining of the tissue with hematoxylin-eosin, it was possible to make a more careful study of the median nerve with the attached scar.

The histological examination disclosed an immense number of neurilemma cells. A fair number of new medullary sheaths could also be demonstrated, the same as occurs after primary suture of a monkey's median nerve or a dog's sciatic nerve. As evidences of active regeneration, beaded myelin sheaths could be demonstrated. At the distal end of the segment, young myelin sheaths could be seen running wave-like in parallel rows, and in one portion of the section there were found a large number of parallel young axis cylinders. The neurilemma nuclei were abnormally abundant, but without any evidence of mitotic figures. In some of the sections also, many degenerated axis cylinders and degenerated myelin sheaths, broken up in fragments and with absence of neurilemma nuclei, could be demonstrated. New axis cylinders could be seen breaking through convoluted myelin sheaths in a wavy manner. There was also an occasional neuroblast with myelin deposit running into new and narrow myelin sheaths and coming out of some of the neuroblasts there were wave-like prolongations resembling young and regenerating axis cylinders.†

In the work of Harrison,[13] it was shown, from the standpoint of embryological development, that the protoplasm of the developing nerve fibre is very actively ameboid, retaining its pseudopodia at its distal end. This protoplasm is drawn out into a thread, which becomes the axis cylinder of the nerve fibre. Evidently, therefore, in our case, the regenerating axis cylinders were very young, in fact, had not gone beyond the stage of early neuroblast development.

This histological examination justified the viewpoint that the proliferation of the large number of neurilemma cells had for its object the removal of the functionless fatty substances of the medullary sheaths which break up in the process of nerve degeneration. Certain chemotropic influences may also be at work, as shown by Forssmann,[14] who demonstrated that degenerating nerve tissue would attract the regenerating fibres. For the regeneration of a peripheral nerve fibre, the activity of the neurilemma cells is responsible, and consequently they occur in large numbers.

It is both the ameboid characteristic of the regenerating central fibre, and the chemotactic influence of the cells of the sheath of Schwann of the peripheral segments, which leads the young axon towards its old path. The latter, however, may be blocked by the formation of scar tissue, as in our case, or by the presence of bulky sutures, in each instance leading to an interference with the regenerative process.

In our case, the regenerating nerve fibres were seen at both proximal and distal ends of the scar. Although about two and a half years had elapsed since the traumatic severance of the median nerve, yet the clinical evidence for partial regeneration was seen in isolated pain points within an area otherwise completely analgesic, and also slight pain points in the epicritic zone. The clinical evidence for this active and selective regeneration was verified by the histological findings of active nerve regeneration. The nerve did not completely reëstablish the lost sensory and motor function in spite of the active regeneration, because of a blocking of the new and young axis cylinders by scar tissue. According to Balance and Stewart, new axis cylinders and medullary sheaths never attain full maturity, but remain in the incomplete, embryonal stage, unless the distal segments are

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† In Ballance and Stewart's work there were several plates which showed identical evidences of regeneration as could be demonstrated in my case. See particularly Plate 12 (figs. 1, 2, 3), Plate 2 (figs. 6 and 7) and Plate 5 (fig. 3) for evidences of regenerating axis cylinders.

joined by suture to the proximal. Evidently some stimulus afforded by the conduction of impulses is necessary in order to permit of the full development of the axis cylinders and medullary sheaths. This stimulus may be furnished by electrical treatment, although regeneration may take place, but much more slowly, without the use of electricity, Since after the injury, there was only an incomplete joining of the distal to the proximal segments, due to the blocking from the scar tissue, only an incomplete regeneration took place, as shown by the clinical and histological evidence.

What, then, was the evidence for further regeneration of the median nerve, after the removal of the scar tissue and the secondary suture of the nerve? This can be best seen from the subsequent examinations, during which time electrical treatment was uninterruptedly given.

Examination. (March 11, 1916.) There was apparent increased strength of the index and middle fingers, but all the other muscles were still weak. The nails remained brittle and the atrophy remained unchanged. The atrophied muscles showed a diminished and slow reaction to faradism. To the galvanic current, the reaction was fairly brisk, with a partial polar inversion (An CC =Ca CC). The sensory disturbances (see Fig. 2) were about the same as at the previous examination, except that the number of pain points (due to beginning regeneration after secondary suture) was smaller than at the first examination. These pain points could be demonstrated with more extreme lengths of the hair esthesiometer than at the period previous to the operation, such as 15 mm. and 20 mm. lengths, showing that the regenerating fibers for the discrimination of pain, were in a very hypersensitive condition, a proof of the success of the regenerative process. The errors in compass discrimination remained about the same, but without any irradiation phenomena.

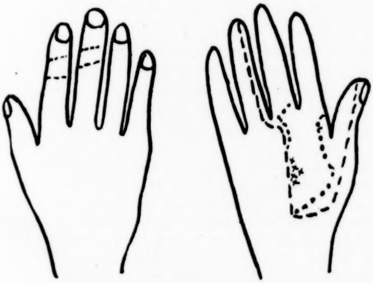

Fig. 2.

Examination. (April 15, 1916.) There is less atrophy, all the muscles show increased strength, while the nails are slowly growing. The reaction to the faradic current remained unchanged, while with galvanism the polar formula has become normal, and the minimum contraction with the anode is obtained with 5 cm.a., as compared with 6 m.a. at the previous examination.

The examination for sensation showed the greatest amount of improvement (see Fig. 3). The area for epicritic disturbance had become somewhat less in extent, while the protopathic area had grown decidedly smaller and showed a marked increase in the number of specific pain receptors. These pain points could be demonstrated, not only with the needle esthesiometer, but also with the hair esthesiometer (von Frey) at varying lengths from 10 mm. to 20 mm. The pressure sense was perceived with von Frey's hairs at 10 mm. and 20 mm. over the upper portion, and also over the entire epicritic area. At 30 mm. hair length there was felt a faint sense of pressure, but no pain.

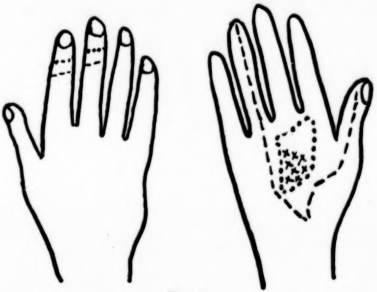

Fig. 3.

This examination showed a marked increase in the number and area of pain points, thus demonstrating an active and increasing regeneration in the receptor organs for pain. These protopathic fibres were not only the first to regenerate, but they also regenerated as an independent system. Likewise, as shown by the tests with von Frey's hair esthesiometer at 30 mm. length, the threshold value for deep sensibility is more delicate than for pain points, because deep sensibility is appreciated by the receptors called muscle spindles and the pain points by the independent, specific receptors for pain. This fact was demonstrated and pointed out in my previous work on the ulnar nerve lesion.

Case 2. A young man, 31 years of age, on Feb. 21, 1916, fell on some glass, inflicting an incised wound in the palm of the left hand and injuring some of the branches of the median nerve. About ten days after the accident, he noticed that the grasp of the fingers became weak, and a little later there was numbness of the thumb and middle fingers. *An examination* on March 8, 1916, disclosed the following condition:

There was a 3.5 cm. scar in the upper portion of the palm of the left hand, immediately above the palmar digital branches of the median nerve. The scar was somewhat tender, with irradiation of the thumb and middle finger.

Motility. Moderate weakness of the flexor digitorum sublimis, flexor pollicis longus and also of the flexor digitorum profundus of the index finger. The flexor pollicis brevis was weak and showed moderate atrophy. All the other muscles innervated by the median nerve were strong.

Sensation. (See Fig. 4.)[‡] Over a portion of the palmar sensory distribution of the median nerve, there were disseminated areas of disturbed epicritic sensation, in the midst of which a large number of hyperalgesic pain points could be demonstrated with the needle esthesiometer and with von Frey's hair esthesiometer at 10 mm. and 20 mm. lengths. There was complete inability to appreciate dull compass points 1 cm. apart in the area of disturbed sensation.

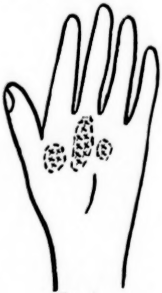

Fig. 4.

Electrical Reactions. There was no change of the weakened muscles to faradism or galvanism. Under electrical treatment, there was complete recovery in about two months. The improvement, as shown by subsequent examinations, was as follows:

Examination. (April 8, 1916.) The scar is less sensitive and there is less atrophy of the flexor pollicis brevis. As a whole, the weakened muscles are much stronger. The area of disturbed (epicritic) sensation is decidedly less in extent, but within this area, the regenerating pain points can be demonstrated with the hair and needle esthesiometers, as before. Of course, with the diminished area of sensory disturbance, the regenerating pain receptors had disappeared outside of the area as regeneration became complete. (See Fig. 5.)

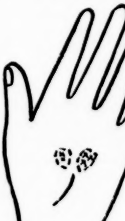

Fig. 5.

Examination. (April 27, 1916.) The formerly affected muscles are now of normal strength. There is now only a very small area of disturbed sensation, about 0.5 cm. in diameter, at the base of the scar. Within this area, the pain points can be demonstrated only with the needle esthesiometer and not at all with the hair instrument. These pain points are more isolated and less sensitive (see Fig. 6), showing that regeneration was proceeding more slowly than immediately after the injury.

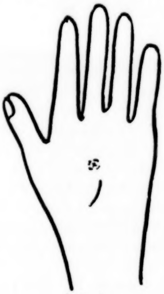

Fig. 6.

Examination. (May 15, 1916.) No further disturbance of sensation. Recovered.

This case was interesting, in that recovery was very rapid. The clinical evidence for this was seen in the large number of pain points from the beginning, showing a hyperactivity of the newly regenerating receptors for pain, and the gradual decrease in the sensibility of the pain points as recovery progressed. Furthermore, the type of regenerating sensory disturbance was unusual, as the protopathic system was of the same area as the epicritic, instead of being less in extent, as is usually the case.

Case 3. A somewhat similar type of an unusual, regenerating sensory disturbance was found in a woman of sixty-three, in whom some of the fibres of the median nerve were injured and caught in scar tissue, after an operation for ruptured tendon of the thumb. Immediately after the operation, there was a sensation of numbness over the distribution of the median nerve, followed later by some spontaneous pain and hyperesthesia to heat and cold. At the time of the examination, about four months after the operation, the sensory disturbance had greatly diminished in extent and intensity.

Examination.

Motor Flexors of fingers strong. Moderate wasting and slight weakness of the thumb muscles supplied by the median nerve.

Trophic. Nails normal. A little mottling of the skin and some excessive sweating over the thumb.

Electrical Reactions. The wasted muscles show no change to faradism. To the galvanic current, the reaction to the anode is slow, to the cathode quick. There is no polar inversion (An CC<Ca CC).

Sensory Examination. (See Fig. 7.) A camel's hair brush over the palmar surface of the hand, including the index and middle fingers and half of the ring fingers, produces a tingling sensation, while over the dorsal aspect of the middle and ring fingers (terminal phalanges) there is a diminished sensation. Over the palmar surface, with the needle

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[‡] In Figures 4 to 6 inclusive, the unbroken line in the palm represents the scar.

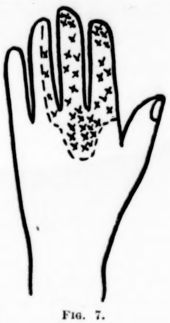

Fig. 7.

esthesiometer and with von Frey's hair esthesiometer at 10 mm., 20 mm., 30 mm., and 40 mm. length, a large number of hyperalgesic pain points can be demonstrated in the midst of the area of disturbed epicritic sensibility. The pain points are more crowded together in some portions than in others. There is no disturbance to the dull compass points.

Case 4. A young man, age 21, caught his left hand in a machine and cut the tendons on the ulnar side of the left arm, including the flexor carpi ulnaris. Immediately after the accident, numbness of the ulnar side of the left hand was noticed. An examination eight days after the accident disclosed the following condition:

Motor. A little weakness of the flexor carpi ulnaris and also of the adductor pollicis. The hypothenar group of muscles and the interossei were very weak.

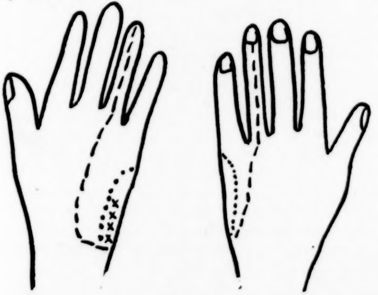

Fig. 8.

Sensory Examination. (See Fig. 8). There is a marked disturbance of both the epicritic and protopathic sensation over the ulnar distribution. On the palmar surface, in the midst of the area of complete analgesia, isolated pain points, with irradiation during the test to the end of the little finger, could be demonstrated with the needle esthesiometer and with von Frey's hair esthesiometer at lengths varying from 10 mm. to 30 mm. inclusive. Compass points 1 cm. apart could be appreciated as only one point over the area of disturbed sensation.

Electrical. The weak and atrophied muscles fail to react to a strong faradic current. The reaction to galvanism is slow and vermicular, the minimum contraction with the anode not being obtained until the current became of 8 ma. strength, as compared with 4 ma. on similar muscles of the unaffected hand. There is complete polar inversion (An CC>Ca CC).

Case 5. A woman, age 55, accidentally cut the base of the right thumb with a plate. Since the accident, the thumb has felt numb and painful. *An examination* three weeks after the accident, demonstrated the following conditions:

There is no weakness and no atrophy of the thumb muscles. At the base of the right thumb, there is a 3 cm. semi-circular scar. Over the thumb area of the cutaneous branches of the median nerve, marked sensory disturbances can be demonstrated (See Fig. 9). The protopathic area of disturbed sensation covers nearly the entire thumb, and within this area, instead of external to it, as is usually found, there is an area of disturbed epicritic sensation. Within this latter zone, pain points can be demonstrated with the needle esthesiometer at 10 mm. and 20 mm. length.

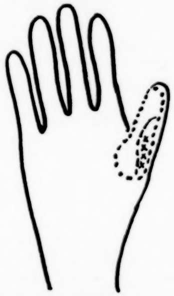

Fig. 9.

In this case, as in one other of the series (Case 2), there is an unusual or reversed order of sensory regeneration, in that the epicritic area is within the protopathic.

Case 6. A boy, 11 years of age, on Dec. 17, 1915, accidentally thrust his left hand through a window pane, inflicting a severe cut on the wrist. Immediately after the accident, there was difficulty in using the fingers. Five weeks after the accident an *examination* disclosed the following condition:

There is a scar on the left wrist over the median nerve. Tapping this scar produces a tingling sensation on the thumb and index finger. Sensory disturbances over distribution of the median nerve. Wasting of some of the muscles supplied by the median nerve. No polar inversion to the galvanic current.

Examination. (Feb. 10, 1916.) All the muscles innervated by the median nerve are weak and atrophied. No glossy skin or trophic disturbances of the nails. The reaction of the atrophied muscles is slow to faradism. To the galvanic current, the reaction is very slow and with a partial polar inversion (An CC = Ca CC).

There is a marked disturbance of both the epicritic and protopathic sensation (See Fig. 10), over

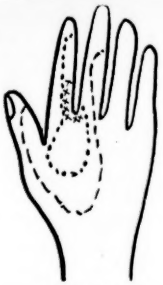

Fig. 10.

the distribution of the median nerve. Within a portion of the pure protopathic area, a group of pain points can be detected with the needle esthesiometer. Within the area of pure epicritic disturbance, there is total inability to distinguish two compass points 1 cm. apart (100% errors). No sensory disturbances over the dorsal surface of the hand.

Examination. (March 15, 1916.) The sensory disturbances and the number of pain points remain about the same, with the exception that there is more irradiation in the stimulation of the pain points and, furthermore, they can now be demonstrated with the hair esthesiometer at 20 mm. (increased sensitiveness of pain receptors showing active regeneration). The compass test now shows only about 60% errors. There is less muscular weakness and atrophy, and the reaction to faradism is now about normal, while to the galvanic current, the reaction is more brisk and with a return to the normal galvanic formula (An CC<Ca CC).

Examination. (April 20, 1916.) With the exception of the finer movements of the thumb, all the muscles innervated by the median nerve are now stronger. The electrical reactions remain unchanged. The compass tests, 1 cm. apart in the epicritic area, now show only about 40% of errors. The most marked improvement is shown in the character of the sensory changes (See Fig. 11).

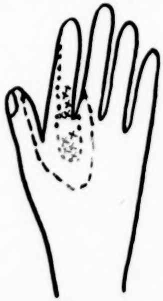

Fig. 11.

The area for both epicritic and protopathic disturbance has grown smaller and there is a large increase of pain points with painful irradiation in the midst of the protopathic area, with both the needle esthesiometer and von Frey's hair esthesiometer at 10 mm. and 20 mm. length. This increase of the active pain receptors demonstrates an increasing regeneration.

On the basis of my previous contribution and of the clinical and neuropathological data here presented, the following conclusions may be drawn:

The nerve supply of the skin is not only different for the various receptors for pain and touch, but each of these regenerates at varying periods after a primary or secondary nerve suture. The time necessary for the beginning of the regenerative processes varies, although definite evidence of regeneration could be found within less than a month after suture of a nerve.

The best evidence of regeneration, both from the standpoint of time and of successful nerve suture, is seen in the protopathic system. Here, when the tests are carefully made, pain points of various intensity and number can be demonstrated in the midst of an area otherwise completely analgesic. That these pain points are evidences of a regenerative process in the nerve was demonstrated, not only clinically, but was also completely corroborated in one case where it was fortunate enough to secure a histological examination after a secondary nerve suture.

The decrease in the threshold-sensibility of these pain points seems to run parallel with the time and success of the nerve suture. By this is meant, that during the period of early regeneration, the pain points are very hypersensitive, probably a type of protective mechanism in order to guard the end-organs of the skin from external injury during their most delicate period. As the process of regeneration proceeds, these pain points become less and less sensitive, finally disappearing altogether when regeneration is complete.

It seems, also, from our clinical and neuropathological studies, that the true source of regenerative processes in the nerve trunks is to be found in the neurilemma cells of the nerve trunk itself. It is in the presence of the neurilemma cells, or rather on their very active proliferation, that the possibility of regeneration and recovery after injury or suture is based. Such a theory of the mechanism of nerve regeneration[*] has an important bearing upon the conception of the histogenetic structure of the nervous system and also upon the more practical aspects of the evidence of regeneration after primary or secondary suture.

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[*] See on this point the various important publications of S. Ramon y Cajal.

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POSSIBILITIES IN SOCIAL SERVICE FOR PSYCHOPATHIC PATIENTS.[*]

BY MARY C. JARRETT, BOSTON,

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SOCIAL service for psychopathic patients appears at first thought as a new subject; but actually in principle and in practice it is as old as medical care of the insane; for the treatment of mental disease is essentially so largely concerned with environment, that physicians in hospitals for the insane, and alienists in private practice, have always performed many services for their patients which were of the nature of social rather than medical work. It is the application of the principles of social service through systematic organization that is new, a development of the last five years. This movement for organization is receiving impetus from four strongly marked tendencies of the present day,—(1) a quickened sense of the importance of the individual; (2) the demand for the highest possible efficiency in all work; (3) an increasing realization, with more exact knowledge, of the relation between psychopathic conditions and crime, pauperism and other social maladjustments; and (4) the rapid spread of the principle of prevention in medicine.

Increased interest in the individual is one of the characteristics of the present day. In medicine we are no longer satisfied that attention to the social needs of the patients shall be casual, depending upon the personal interest or available time of the physician.

When you send a friend to a hospital you have a right to expect that everything shall be done for his improvement that can be done,—if he needs a change of environment or a new kind of occupation more than hydrotherapy, naturally the hospital should be equipped to supply the social remedy as well as the medical treatment.

Efficiency requires that hospitals watch over their discharged patients for a period, to insure continuation of the improvement effected by the hospital care and to prevent relapses, as a result of the sudden transition from the sheltered hospital life to the perplexities of community life. This fact is recognized in the practice of discharging committed patients on trial, the first six months being considered a "visit" away from the hospital, during which the patient may be brought back if necessary. Obviously, it is desirable that these patients should be visited at their homes, that they should be assisted over difficulties in the way of securing proper living conditions, suitable employment, recreation, and congenial companions. If after months or years of care, the hospital discharges the patient to sink or swim, it is not completing its function; for lack of a proportionately small outlay it fails to reach its highest efficiency in the recovery of patients.

Relations between social and mental disorders, recently more widely studied and practically considered than in the past, lead the sociologist and the social worker to a more immediate interest in mental defect and mental disorder. The responsibility of the state for support of the dependent insane and the physical care of the insane in hospitals have always been matters of concern to social workers, and many of the reforms of the last twenty-five years in improved hospital conditions have been secured by the combined efforts of physicians and social workers. The first meeting of the National Conference of Charities and Correction in 1874 was devoted chiefly to the subject of "The duty of the states toward their insane poor,"[2] and the first address was by a physician. Further studies and experiments to advance our knowledge of the social bearings of psychopathic states will depend largely on the activities of social workers.

Preventive medicine demands the treatment of the earliest symptoms of mental disease with a view to preventing, or at least deferring, acute attacks and chronic conditions; and it is only through following the patient into his daily life, and working upon his environment, that these early symptoms can be understood and treated.

These influences have led to a demand for social service as part of the organization of the hospital. Recently in New York, the State Hospital Commission, through the assistance of the State Charities Aid Association, began the work of organizing social service in all the state hospitals, fourteen in number. Two only already have a social worker. In six of the state hospitals of Massachusetts, a beginning has been made with one social worker in each hospital, except the Psychopathic Hospital which has two on public salary. A letter of inquiry sent to all the states brought out that only two other states have attempted any organized form of social service in insane hospitals,—Minnesota, which has one visitor in one of its five hospitals, and Wisconsin, which has a visitor for each of its two hospitals. Replies from superintendents of state hospitals in eighteen states either said that plans for social work were under consideration, or expressed regret that it had not yet been undertaken.

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[*] Read before the Conference of the Massachusetts Society for Mental Hygiene, Ford Hall, Boston, Nov. 18, 1915.

Superintendents of state hospitals are reported to be opposed to the organization of social service in connection with their hospitals. This is hearsay, for I have never met any superintendent who bore out this report, and I am inclined to doubt its accuracy. The true meaning of the report I take to be, that superintendents are wary about admitting into the intricate mechanism of a large hospital, a new type of assistant, not previously instructed, to do work which involves responsibilities as serious as the physician's and offers almost unlimited opportunities for interference with the medical work. However, if the social workers are carefully selected and are able to perform their own functions successfully without assuming functions which are not theirs, the suspicion or indifference of the physicians will be dissipated by the obvious value of their assistance.

Even the superintendent in Nebraska, who wrote, "Everyone employed here is supposed to act as a social agent for the benefit of all patients," would doubtless be glad if he saw more things for the benefit of more patients being done by a special agent, than could be done by anyone else in the institution.

In systematizing the social work of a hospital the first thought naturally is that a physician should be detailed for this work; and there is no reason that I can see why a physician should not make the best kind of social worker if he is willing to turn all his energies into a line of work that is not primarily medical. The necessity for this specialization in order to attain excellence is presumably as true in social work as in other lines. Fifteen years ago health officers were physicians who gave to the work only a part of their time; today, with the rapid development of sanitary science, the public health officer is either a physician or a layman, specially trained and on full time.[3] The prospect is that the psychopathic social work of the future will be done by persons, who, whether or not they have been previously trained for medicine, for nursing or any other calling, shall have had training for social work with specialization in psychopathic social service. General training in social work is now offered by half a dozen private training schools in this country, and will undoubtedly be offered in time by the universities. A significant step in this direction is the post-graduate course in Social Economy and Social Research given at Bryn Mawr College for the first time this year. In coöperation with the private training schools and the graduate schools, the psychopathic hospitals should be able to offer special training for psychopathic social work.

I am discussing the professional and administrative aspects of the subject, because I believe that is what we need to emphasize at present. We are getting past the time when, in order to secure interest, it was necessary to tell sad stories of the misfortunes of patients who had gone unassisted from our hospitals because their social needs did not happen to come to the attention of the doctors; or to tell of the joy in life made possible for young women saved from invalidism and found healthful employment and congenial homes through the efforts of social workers. In the beginning of any movement our attention is caught by the appeal to our emotions, we are stirred by individual human needs. Twenty-five years ago, in urging reform in the care of the insane, it was necessary to dwell on the horrors of cells and chains. Now I do not need to tell you how social work saved from chronic invalidism a young girl suffering from a generalized tic, which caused her to jerk her limbs so badly that she was incapacitated for work or for any social life; or how a man cut off from a skilled trade at the age of forty by an occupational neurosis was saved from the almshouse or suicide by having other means of livelihood obtained for him. No one now fails to see that certain patients require attention to their social needs as a part of their treatment from the hospital,—convalescent care, employment, temporary financial assistance, etc. But we have hardly begun to urge that every patient should have the benefit of this social care, if he needs it. To discover the need requires an examination of the social condition. It seems logical to expect that social examination and treatment should be part of the hospital care of every patient.

Among psychopathic patients it is sometimes found that the treatment is entirely social, as in cases of defective delinquent girls; some cases will be found on examination not to need social care; in most cases medical and social treatment dovetail—the neurasthenic who has become so despondent that he cannot go on with his work, and fears he will commit suicide, needs not only medical care but also financial assistance to relieve his well-founded anxiety about his family, and more blankets so that he may sleep alone instead of with his youngest son. In seventy-five per cent. of the cases at the Psychopathic Hospital it seems clear that adequate care of the patient requires social work.

Along with the immediate care of patients there are certain indirect results from systematic social service, which are of no less importance. (1) Medical work is promoted by the assistance given to physicians by social workers in obtaining the histories of patients. Often a diagnosis is not possible without a knowledge of the patient's past conduct and environment. In many cases continuous observation of the patient in the community, and experiments in adjustment of his environment, are necessary before the diagnosis can be determined. In this way an earlier diagnosis can be made, which is not only of primary importance to the patient, but also important to the study of mental disease. In treatment, the physician is assisted by the social worker who sees that patients, who otherwise would fail to return to him, report at the hospital as long as he considers it necessary; and also sees that patients carry out his directions.

Many medical problems on which psychiatrists are working cannot be studied thoroughly without social work; for example, in studying the effects of syphilis in families of known syphilitics, it is essential to have a social worker who can persuade the families to come to the hospital for examination.

(2) The hospital social worker serves the community in seeing that families of patients, who otherwise would drift into privation, are provided for or helped to be self-supporting;—a mother left with two young children when her husband was committed is able to support them with the help of a relative, a day nursery, and a position that was found for her. Another saving to the community is brought about through the examination and early treatment of other psychopathic individuals in the families of patients. In one family nine persons, in addition to the little girl who was the original patient, are now under the care of the Out-Patient Department at the Psychopathic Hospital.

(3) The saving of expense to the state in the prevention of crimes by psychopathic indivduals through social supervision cannot be calculated; but specific instances indicate that it may be considerable. Several years ago Mr. Homer Folks said the State of New York spends "one-seventh of its income in taking care of its insane, but it is a relatively unproductive expenditure."[1] This year the New York state hospitals will spend approximately $7,000 of their appropriation for social service as the first step in a general movement for preventive work.

Through the care of social workers, many patients who would become a charge upon the state are kept at home either self-supporting or maintained by relatives. During our two years' work at the Psychopathic Hospital, twenty patients, who by all indications would otherwise have required institutional care, have been kept in the community through the activities of the Social Service. Averaged at a saving to the state of one year's maintenance each, they show a saving of $5,200, which is $700 more than the amount paid by the state in salaries to our social workers during this period. As three of these patients, who were insane, were returned to their native countries, the state was probably saved in their cases many years' support. So that in relation to the state treasury, this department has more than paid for itself.

A community plan for social service for psychopathic patients would begin with the public health service. Child hygiene is now a recognized part of this service; for physical illness private organizations furnish district nurses; and the health officer is beginning to talk of mental hygiene as a function of public health work. This would mean eventually a psychopathic social worker in every district, working in coöperation with the psychopathic clinics and hospitals, under some form of organization that would insure both social and medical supervision. Then each hospital should have its staff of social workers, both for out-patients and ward patients. At the present time for all the state hospitals of Massachusetts the necessary number of social workers would probably not exceed 25, estimating that one worker is needed for every 200 admissions in a year.[4] This number does not seem surprisingly large when it is considered that the State Board of Charity employs about 100 social workers in the care of dependents; the Boston Consumptives' Hospital alone requires 24 visiting nurses; the Massachusetts Training School employs 16 visitors for their paroled boys and girls. There were 147 physicians, exclusive of superintendents, employed by the state hospitals last year. Taking into consideration the large proportion of time a social worker must spend in travelling, the proportion of the number of persons required for the social work in relation to the medical staff is not high.

A comprehensive plan for social care of the psychopathic also includes a certain amount of knowledge of mental defect and mental disorder as part of the training of all social case workers in whatever agencies. The social worker of a relief agency who, instead of thinking a man whose family had applied for aid, was "lazy, cranky, or ugly," recognized indications of general paresis and sent the man to our Out-Patient Department, has saved much suffering and wasted effort, and has given the man what chance there may be of improvement through treatment. The visitors of social agencies have large opportunities for bringing under medical care early cases of mental disease.

In conclusion, social service for psychopathic patient seems to be a natural development in the movement for improved care of the insane. It has its origin in practices that have always existed in hospitals for the insane in an unorganized form. As a systematic method, it has been stimulated by recent developments in sociology and medicine. The medical profession will naturally move with caution in the extension of systematic social work, and it is well that they should, so long as caution is distinguished from inaction. The logical development of the prinicipIes of social service leads to the belief that eventually social examination and treatment will go hand in hand with medical examination and treatment in the care of all psychopathic patients. To realize this object the training and education of social workers must be advanced to be comparable with medical training. Ultimately, it may be expected that psychopathic social work will be part of the local public health service and of the organization of all psychopathic and insane hospitals.

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INEBRIETY FROM A MEDICAL VIEWPOINT.*

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A review of the literature on alcoholism reveals the need for a more extended and comprehensive clinical study of alcoholic poisoning. Considerable laboratory work has been accomplished, but the study of inebriety and the results of alcoholic excesses have been approached mainly from physiological and pathological viewpoints. The clinical manifestations are imperfectly described and quite generally misunderstood. It is true that textbook descriptions and classifications are procurable, but when these are applied to practice they are quite generally found to be inadequate and inconclusive. The ignorance of the physician to the true clinical significance of inebriety is proverbial. The neglect properly to instruct the medical student, and a natural disinclination of the physician to seek for knowledge, which is but imperfectly described, may be offered as justifiable excuses for this unenlightenment. From a sociological point of view, the problems of drunkenness (alcoholic poisoning) have received praiseworthy attention. The failure of the medical profession to assume the rightful leadership in this medicosocial work is largely responsible for the many exaggerated statements which have been advanced by well meaning persons on the use and abuse of alcohol. Many of these promoted theories are quasi-medical and have been accepted by the public as authentic and scientific. Much of the data thus compiled, incomplete and insufficient as it is, has heretofore served as the working capital for the advancement of a theory for the exploitation of an alleged cure. It has been said with considerable truth that much harm has resulted from the abuse of alcohol, but it can also be said that an equal amount of harm has come from distorted reports, emanating from well meaning, but misinformed, extremists. The omnipresent charlatan and nostrum-maker has taken advantage of these divided and diversified opinions, and has profited at the expense of a credulous public. I mention these facts to emphasize the conviction that these lamentable conditions would have been less likely to occur if a medical censorship had been exercised and consistently employed. It is not within the scope of this paper to deal with the physiologic and pathologic aspects of alcoholism; rather would I have it understood that my intention is to argue for a more rational and comprehensive clinical study of the alcoholic,—a study which will allow for a logical practice of preventive and curative measures. The study of a condition or a disease must necessarily begin by studying the environment of the individual responsible for the state or disturbance. Inebriety is no exception to this rule. The study of the inebriate is necessarily the foundation stone for any suggestion advanced to the public for the amelioration or control of drunkenness. The modern laboratory study of defectives has revealed an amazing number of incompetents with a graded responsibility intimately related to the quantity and quality of the incompetency. Quite a considerable number of these incompetents are what is termed "alcoholic deteriorates," who are not certifiable cases of insanity, yet it is evident to the analysist that such cases are not of normal makeup; they are not feebleminded, and for categorical purposes they are assembled as "alcoholics." A peculiarity is recognized in these people, but until this peculiarity is accurately defined we are obliged to withhold its description. When we study the non-criminal alcoholic we detect in one type, namely, the inebriate, a peculiarity, or, more properly speaking, an idiosyncrasy which is pre-existent, antedating the alcoholic symptoms. This idiosyncrasy to alcohol, which is analogous to individual idiosyncrasies to other drugs, is distinctive, and is really the underlying or predisposing cause for the inebriate syndrome of which drunkenness is the pathognomonic symptom. The failure to recognize and properly to treat the distinctive constitutional peculiarity preceding the drunkenness is responsible in great part for many ill successes, and can also be held accountable for many incongruous methods advanced for the cure of habitual drunkenness. Delayed diagnosis, delayed until the alcoholic syndrome is confirmed and attended with recognizable physical and mental ailments, is unfair to the patient, and is manifestly a medical error, which could have been prevented by a skilled diagnostician.

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* Read by title before the American Medico-Psychological Association, April, 1916; and before the Norfolk District Medical Society, October 31, 1916.

Alcoholism, as a clinical study, is divisible into its component parts. The successful care of any case demands, not only individualization in the method of treatment, but an accurate differentiation of the types and an appreciation of the personal equation. The neglect of the clinician to practice these precepts can be held responsible for ill success in his treatment of many cases of alcoholism.

Inebriety is but one phase of alcoholism, yet in this form we have the acme or the extreme of acute poisoning; in other words, in its incipiency we find the sum total of the symptoms of drunkenness in its true and uncomplicated form. Owing to the fact that the inebriate by the nature of his condition is conspicuous, the inebriate type of alcoholism, namely drunkenness, has excited the major share of public attention, and paradoxically this type has received the minimum degree of medical study. Chronic non-inebriate alcoholism, from a mental and physical point of view, is a well-studied disease. Its symptoms are clearly described and well understood; its assignable causes have been determined, and the methods for its cure or amelioration have been developed on uniform lines.

It can no longer be said that the chronic inebriate is an enigma. The study of inebriety has shown conclusively that the victim is pathologic; furthermore, it has been proven that the chronic inebriate condition is a clinical entity, and that the pathognomonic symptom, habitual drunkenness, is but an expression of a constitutional peculiarity, the peculiarity intimating a susceptibility to a toxic agent. It is not sufficient for us to dismiss the subject by a mere acknowledgment of the condition, and declare the drunkenness wilful in the sense that the drunkenness and the consequent symptoms could have been controlled by the patient. With as much reason could we maintain that the paroxysms of hysteria or the habit mannerisms of the neurasthenic could be controlled or prevented by the sufferer. In these two mental diseases, we recognize a psychoneurotic cause; an analogy can be observed in the inebriate condition. The failure of the physician to recognize the underlying mental causes which are alone responsible for the inebriate syndrome, has been the incentive for the many ill-timed, ill-regulated, and unethical methods which have been advanced for the cure of drunkenness. The attitude of the medical profession toward inebriety should be in its fullest sense an appreciative one, an appreciation of its true significance, and coincident with this appreciation there should be an intimate knowledge of the preventive and curative measures which should be employed for the proper management of the condition. It is not consistent with our medical ideals and our humanitarian instincts to neglect a subject that is one of the more important medico-social studies of the present day. Habitual drunkenness from a social and economic point of view has received a vast amount of study, and yet even a cursory review shows a mass of facts which lack correlation and reliable censorship. Assuming that the physician appreciates that inebriety is a distinctive condition, and that the inebriate requires specialized treatment, what should be his method of approach? It must be admitted that many erroneous and unchallenged opinions existing for many years, and which have been accepted by many persons, offer certain obstacles which must be removed before a universal plan for the treatment of habitual drunkenness can be advanced and adopted. It has been found, however, that when properly approached, these wrongly informed persons are susceptible to education. In this respect the duty of the medical profession is clearly an educational one,—an education of the people to a public health measure, and to the need of a definite system for the care of inebriates which will be rational, effective and capable of universal adoption. It should be remembered that from a medical viewpoint, we are looking at the matter of alcoholism in a purely practical, but withal in a scientific, way. Sentimental antagonism and generalized and exaggerated statements have formerly operated against any decided advancement in the way of popular education on the dangers and abuse of alcohol. We should remember that reforms, to be enduring, must always be of slow growth. For countless ages, mankind has made use of alcoholic beverages, and the customs and habits of a people cannot be changed over night. Some people think that they can rightly use alcohol, and that the prevention of its use by them would be a constitutional wrong. It is, of course, much easier to show the misery, want, and suffering occasioned by drinking, than it is to set forth the fancied enjoyment that a number of normal-minded persons find in the use of liquor. All people are not cast in the same mould and cannot be made over by law, desirable as this might be in some cases. Those who seek this end through prohibitory legislation run counter to a factor in human nature that it is never safe to ignore. It is the duty of the physician to admonish every person to acquaint himself with the argument against abuse of agents which have been proven under certain conditions to be poisonous. As physicians and clinicians, we should be prepared to make a sharp distinction between the effects of alcohol *per se* and the contributing factors which are usually present in the life history of an alcoholic; alive to this issue, we would then be able to differentiate between cause and effect. Again, with such a knowledge we could, in our differentiation, realize the influence of the predisposing factors which antedate the alcoholism. An intimate study of the statistics of alcoholism will often develop inaccuracies which invalidate many carefully prepared statistical tables. It is at once apparent that here again proper medical censorship would have minimized these errors and prevented misunderstandings which have handicapped us in our educational campaign.

The following deductions are offered as medical truisms. We have elaborated them from our experience and offer them as a working basis.

(*a*) Inebriety is an expression of nervous weakness or instability. Used in its simplest sense, it could be called a psycho-neurosis. Many cases show symptoms which are found in neurasthenic states and allied conditions. Drunkenness is a symptom of an unstable nervous system, and a contrary view is not justified by clinical observation or experience.

(*b*) The exciting causes of inebriety are of a physical and psychical origin; given a predisposed subject, the crisis of inebriety may be precipitated by any marked departure from ordinary routine (psychical), or by any disturbance of a physical nature (physical).

(*c*) Inebriety is prone to develop at the critical epochs of life, namely, pubescence, adolescence and involution. Developing during involution, it is generally the effort of an individual to maintain his productive powers by recourse to artificial stimulation. The declaration of inebriety at these periods suggests an analogy to the psychoneuroses.

(*d*) Inebriety, being an expression of neuropathy or psychopathy, may be preceded by or accompanied by a multiform nervous syndrome. Thus each case is essentially different.

(*e*) A comparatively small percentage of the users of alcohol are confirmed drunkards or inebriates.

(*f*) The appropriate care of inebriety implies both curative treatment and custodial care; curative treatment being directed to the case which is likely to be benefited, the custodial care, for economic reasons, should be directed to the recidivists. For the purpose of individualization in treatment, such a differentiation must eventually be made, and an appropriate segregation of these two types established.

The fundamental part of the system which is now in successful operation in Massachusetts is the recognition of the true personality of the inebriate, and consequently an appreciation of the need of specialized and distinctive treatment for the condition. We realize that the syndrome which we call drunkenness has mental and physical elements which require accurate differentiation and individualization. In inebriety there is apparently a physical desire to combat; this physical desire has been described in all probability as a reflex, the dominant cause being a psychologic element of nerve habit; in other words, as one author has very tersely put it, as the alcoholic's physical desires are increased to the point of frenzy by his mental interpretation of such desires, so can no cure be successful without his mental belief that he is improving and can be cured; hence, no cure has been or can be successful that does not treat the mind of the patient,—that is not suggestive. Again, ill success in the treatment of cases can often be attributed to the failure of the physician to recognize this fundamental point in the psychology of the patient; as in other diseased conditions the probability of permanent improvement is enhanced by recognizing inebriety in its incipiency. The pathognomonic symptom of inebriety, alcoholic toxemia, and the consequent habitual intoxication, is an indication for immediate treatment, which should be instituted before the confirmation of the habit. Inebriety is a medico-social study. The medical profession should take the initiative in devising a method for the education of the public to the dangers of alcoholic excesses and abuses. The physician should naturally assume the leadership in promoting any measures inaugurated for the prevention or amelioration of drunkenness. By assuming such responsibility he is exercising his prerogative. The public, assured of the use of a scientific and well-censored method, will eventually regain its lost confidence, and, naturally, it will follow that public sentiment will sustain any practical and uniform method advanced for the treatment of public drunkenness.

THE FRAMINGHAM HEALTH AND TUBERCULOSIS DEMONSTRATION.*

By D. B. Armstrong, M.D., Framingham, Mass.

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Is it possible to discover and to place under adequate medical, nursing and relief supervision all of the cases of tuberculosis, incipient and advanced, in a normal industrial community?

Is it possible to ascertain with some degree of definiteness the responsible social and economic factors in disease causation, including all types of morbidity, not only tuberculosis?

What is the most efficient utilization of the existing means available for the discovery and treatment of disease? What percentage of theoretically preventable disease is practically preventable with the use of known but unused, or at least uncoördinated instruments? What is the best possible adjustment of social forces, existing or to be created, with the objects of the prevention of unnecessary disease and death?

Such in brief are the fairly ambitious questions which Framingham is attempting to solve. If the community is the logical social unit for disease prevention and control, and if the time is right for the application of a complete program for disease prevention and health creation, there is every reason to hope that, in some degree at least, answers to the above questions may be demonstrated. Obviously, the problem is not only one of tuberculosis and not only a health problem; fundamentally it is a problem of social and economic organization.

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* Read at a meeting of the Middlesex South District Medical Society, January 16, 1917.

As announced in the papers and elsewhere, the Framingham Health and Tuberculosis Demonstration is being conducted under the supervision of a committee organized by the National Association for the Study and Prevention of Tuberculosis. On this committee are represented the National Tuberculosis Association, the Massachusetts State Department of Health, the United States Public Health Service, private anti-tuberculosis organizations in Massachusetts, Connecticut, New York and Pennsylvania, and the Metropolitan Life Insurance Company, the donors of the $100,000 to be devoted to the work.

The selection of Framingham was made after several months' study of numerous communities of similar size in various parts of the United States, but particularly in Massachusetts and New York State. Framingham recommended itself to the committee because it possessed certain average qualities, being an industrial community, with mixed industries, varied racial groups, a good local health organization, backed up by an excellent State Department of Health, a normal amount of disease, particularly tuberculosis, well trained physicians and good hospitals, and sufficient promise of coöperation from medical, industrial, commercial and social organizations to give reasonable assurances of success.

As indicated above, the objects of the investigation are to demonstrate what may be possible with united community action in the problem of prevention and control of tuberculosis. Inevitably the experiment, if it goes forward as planned, will broaden out into a general health demonstration concerning itself with the various disease-preventive problems, as they affect the several age groups, and utilizing in its effort at control all potential agencies,—social, industrial, educational, medical, etc.

Briefly stated, the essentials of the demonstration, as viewed by the committee, are as follows:

1. The sympathetic coöperation of all individuals and organizations, public and private, in Framingham.

2. The execution of the program on an educational, persuasive, and democratic basis, social machinery being devised to carry the various elements in the community organization along with the work as it progresses.

3. The utilization of expert advisory service whenever feasible. This principle applies, of course, to general sanitary, medical, nursing, educational, school or industrial problems.

Before this audience, in presenting, in the time allowed for this discussion, the important phases of the program, special attention must be paid to the medical and health aspects of the plan. Consequently, only the briefest mention can be made of other significant steps.

It is, of course, essential that for the work a sound statistical basis be laid, involving the acquisition of data making possible a comparison of existing conditions with conditions during the subsequent years of the demonstration, as well as a comparison between the existing conditions in Framingham, now and later, with similar conditions in other communities of similar make-up, thereby furnishing what, in a sense, should prove to be a control for the experiment.

The initial steps contemplated include the following:

1. The carrying out of a thorough and intensive campaign to acquaint the citizens of Framingham with the objects and methods of the demonstration, laying special emphasis on those phases of the program which depend for their success upon the coöperation of the individual citizen. This educational work would naturally lead to efforts to present the main facts on hygienic living, prevention of disease, particularly tuberculosis, etc., the educational campaign culminating eventually in a general propaganda for thorough, universal, medical examinations for the detection of incipient and preventable or controllable cases of disease.

2. The organization of local committees of a medical and lay character, to coöperate in and advise regarding the work as it proceeds. The plan contemplates not only the organization in this way of leading influential citizens, but also the general selection, possibly on a block basis, of community leaders who will act as agents of interchange between the people themselves and the central committee.

3. An effort to encourage the Framingham health authorities to meet, through their own appropriations, the logical and legitimate routine health needs of the community, such as public health nursing, medical school inspection and nursing, general health administration, etc.

4. The efficient coördination of public and private health and charitable work.

5. A thorough study of community conditions, covering the general sanitary, rural, industrial, school, commercial and office factors, thus assisting the committee in its effort to make a diagnosis of the community health problem, and supplementing the intensive medical canvass to be made subsequently.

For a complete and successful use of available community agencies, it is obvious that certain mutually beneficial and coöperative relations must be established with the health and medical representatives in Framingham. On the side of health and nursing, the problem in Framingham presents no unusual difficulty. The Board of Health, with the assistance of private agencies can, with minor adjustments, meet the routine nursing needs. Any extraordinary or experimental nursing or health needs essential to the working out of the program in Framingham will, of course, be met from the Demonstration Fund.

Incidentally, it may be mentioned that the Demonstration budget includes funds appropriated for extra nursing service, for payments to physicians when making thorough medical examinations, for assisting town and private agencies in the provision of adequate medical nursing and relief care for both home and institution cases, etc.

In Framingham, as probably would be the case anywhere, the problems of medical organization are most fundamental, and at the same time, perhaps, most difficult. The success of many phases of the program, including thorough medical examinations, the detection of early cases of disease, etc., depends upon the sympathy and help of the members of the medical profession. Their criticism and approval of numerous steps must be had. Uniform diagnostic standards and methods for the examination and classification of disease are essential to the scientific value of the demonstration. Not only early cases of disease, but suspected and undiagnosed cases must be gotten in touch with and classified, with the assistance of outside expert medical service. The medical work must always be done through the practising physician, in such a way as not to interfere with the normal medical procedure, except in so far as innovations would give assurances of a higher degree of medical efficiency, and greater uniformity in methods of diagnosis and treatment.

A local organized medical agency is necessary to meet these ends. Such a medical group, or club, including in its membership all of the practising physicians on a common basis of coöperation and service, will prove to be a useful piece of community machinery in the adoption of standards, confidential reporting of suspected cases, the use of expert diagnostic service, the approval of popular educational material on hygiene and preventive medicine, etc. Perhaps the chief function of such a medical club will be the development of a course of lectures and clinics, given by the country's first authorities, on tuberculosis and other problems of interest to the Framingham medical profession, placing special emphasis on the detection of incipient disease, and on thorough medical examinations.

If the campaign to urge the people to go to their doctors for thorough medical examinations is a success, here again the intelligent coöperation of the Framingham physicians will be needed. Such a step, of course, is not contemplated in the immediate future, but would follow an initial effort to give complete care to known cases of tuberculosis, as well as any other obvious cases readily discovered through the examination of individuals in contact with known cases. In a thorough medical survey of the community, however, certain other problems will arise, if the work is to be done on a uniform basis and if it is not to be an excessive burden upon the practising physician. The citizens of Framingham will, of course, be urged to pay what is determined to be a satisfactory fee for the thorough examination. If, however, any members of the community are willing to be examined, but will not meet the expense themselves, this would undoubtedly be considered a legitimate expenditure for the Demonstration Fund.

A thorough medical survey would necessitate the expansion of existing laboratory facilities. The health department laboratory, now doing, with the assistance of the State Laboratory, routine epidemiological work, could perhaps provide facilities for the more ordinary types of clinical laboratory work as well. Many individuals would also be discovered who would fall strictly in the dispensary class, and to meet that need, the existing tuberculosis dispensary might, perhaps, be expanded to include a general medical service, with an open alternating medical attendance, not only for adults, but possibly for school children and factory groups. Such a service might even be placed on a pay, self-supporting basis, and if such a clinic could be developed along the lines indicated, including not only tuberculosis, general medical, school medical, and perhaps dental, but also infant welfare service, there would be created in the community a *health center* truly worthy of the name.

A final criterion of the success of the experiment will be, of course, the condition existing in health and medical circles, subsequent to the withdrawal of the Demonstration Staff. It is hoped, of course, that there may be established eventually an ideal and adequate health machinery. As a demonstration to other communities, this would seem to be an essential.

Obviously, the immediate results of such a program as is briefly outlined above, if successfully carried out, would include not only a direct benefit to Framingham, but ought to involve a demonstration of the economy and social value of united community organization to meet the problems of preventable disease. It ought, indeed, to throw considerable light upon the most efficient methods for meeting health questions in school, factory and elsewhere. It ought also to be significant perhaps in its bearing upon the future of medical service in general.

The Framingham Health and Tuberculosis Demonstration welcomes your inquiries, suggestions and criticisms, standing as it does, as a unique and unprecedented effort in democratic health creation. It is hoped that the work may point the way to the establishment of a hygienic basis for social organization, a physical foundation without which social, economic, and indeed, spiritual evolution is bound to be abortive.

Therapeutic and Preventive Medicine.

THE DRUG TREATMENT OF MORPHINISM.*

By Frank H. Carlisle, M.D., Norfolk, Mass.,

Assistant Superintendent of the Norfolk State Hospital.

In discussing this subject my original purpose was to deal with it from its purely medical aspect, but I find it difficult to do so without referring briefly to the sociological side, the two being very intimately related.

The Norfolk State Hospital maintains an outpatient department having offices at various centres throughout the state, with representatives in charge whose business it is to examine applicants for admission, and to determine whether or not the individual is suitable for treatment; in other words, to select so far as possible only such cases as are likely to derive permanent benefit.

Time and space limit the detailed description of cases of this class, and I will merely state in a general way that those whose home environment is free from vicious influences, whose morphinism is not merely an expression of inherent defectivity, and those not showing criminal tendencies, may be considered redeemable through treatment.

It can readily be seen, however, that in a public institution of this nature, the humane consideration of the case must modify our decisions; careful selection is often impossible, and addicts who would not be received at a private hospital or sanitarium must at least be given temporary care. I refer to those who are found to be too poorly equipped mentally fully to appreciate the dangers attendant upon the continued use of the drug, and the necessity of breaking permanently from its use; to the moral delinquent, whose addiction is engrafted on an unstable moral and mental make-up, and to the individual of criminal tendencies, who sees in morphia the necessary support in the plying of his trade. These types constitute about twenty-five per cent. of our admissions, and reduce the number of favorable results in like proportion. Their influence upon others being distinctly bad, provision should be made for their care and restraint independently of the more favorable types.

From March 1st, 1915, which inaugurated the enforcement of the Harrison Law, till October 31st, 1916, a period of twenty months, there have been admitted to the hospital four hundred and sixty-two habitués. Approximately ninety per cent. of these took morphine in quantities varying from five to thirty grains daily, by hypodermic injection, and ten per cent. heroin, two to five grains per day, usually by insufflation.

Previous to this our method was that of gradual withdrawal, which required from two to three weeks' confinement upon the receiving ward. The new law created a sudden increase in the number of applicants and it soon became apparent that the reduction method must give place to a shorter one which would relieve the congestion in this department.

Acting upon the theory that scopolamin, by virtue of its effect upon the central nervous system, and through a belief that it could be employed in somewhat the same manner in morphinism as in so-called twilight sleep, we experimented with this drug, with gratifying results to the patient as well as to ourselves.

The various forms of treatment, all of which have their adherents, may be grouped under three headings: gradual, rapid, and immediate withdrawal. Our present method is that of rapid withdrawal, and it may for convenience be divided into two periods: first, that of withdrawal, and second, convalescence.

Our routine is as follows: A mixture containing scopolamin hydrobromide gr. 1-150 and morphine hydrobromide gr. 1-6, is given hypodermically on the evening of the day of arrival, and repeated at intervals of six hours during the first twenty-four. The early effects of scopolamin usually make their appearance during this period and are manifested by marked dryness of the throat, with difficulty in swallowing, dilated pupils with blurred vision, and speech becomes difficult and rather jerky. The patient may now, or perhaps not until the following day, become mildly hallucinated (visual and auditory). In conversation his sentences are apt to be short, sharp and often incomplete, due no doubt to flight of ideas and hallucinatory control.

On the second day the intervals for injection are increased to eight, and on the third day, to twelve hours. In typical cases the depressant effect of the drug (scopolamin) presents itself at about this time, continuing as a rule to some degree through the third and fourth days. This stage is characterized by a sensation of great fatigue and drowsiness; the excitement is greatly reduced and the patient seeks his bed and should obtain sleep of from four to eight hours' duration.

On the fourth day there may be some nervousness and gastric disturbance, but usually no craving for morphia. At bedtime the final dose of the scopolamin-morphine mixture is given, together with fifteen grains of trional. This is almost invariably followed by a comfortable night's sleep, lasting from six to eight hours.

Active purgation is obtained during the withdrawal period, through the liberal use of compound cathartic pills, cascara sagrada and salines. It is of vital importance that the bowels should be made to act thoroughly each day in order to rid the system of morphine and its by-products, but the drastic catharsis recommended by some authorities does not in our experience appear necessary.

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* Read at a meeting of the Norfolk District Medical Society, on Oct. 31, 1916.

We frequently encounter individuals who fail to respond to the usual physiological effects of scopolamin, and are then obliged to modify our treatment, increasing or decreasing the rapidity with which the injections are made. It often occurs that through an apparent immunity on the part of the individual, the intervals must be reduced to two or three hours until full response to it is obtained, then lengthening the interval as the case may require. About two per cent. of our cases show an idiosyncrasy to scopolamin, which makes it necessary to discontinue its use and resort to treatment by gradual reduction. These show little more than exaggerated throat symptoms and dilatation of the pupils, are exceedingly uncomfortable and are never able to progress as far in their treatment as the depressed phase.

On the whole we are, in the majority of instances, enabled to remove the morphine from the addict's system with reasonable comfort, in a period of about four days, leaving him in fair general condition. At this time what we may term convalescence begins.

There is no specific treatment for morphinism, and no treatment, whatever the procedure adopted, can be successful in its results, unless it is followed by a prolonged period of convalescence. I wish to lay special emphasis upon this point. Many forms of treatment, having much to recommend them in other respects, fail through the neglect of this important detail.

Immediately after withdrawal of morphine, and for a period of several weeks, the individual is nervous, troubled with insomnia, and in a condition wherein he is torn between conflicting emotions; he is impulsive, lacks self-control, and if not restrained, may suddenly disappear. For these reasons we insist upon a ward residence of from one to two weeks.

Improvement in general bodily health is from now on surprisingly rapid and in a few weeks, under tonic treatment, regulated daily routine, proper diet and out-of-door exercise, the insomnia, which is often troublesome during early convalescence, rapidly improves, and the patient appears and acts more like a normal individual. He is now given the opportunity and assistance to build up his resistive powers, strengthen his will and self-control, and readjust his mental attitude toward the use of drugs. A spirit of coöperation should exist between himself and his adviser, who should have his entire confidence.

Following a residence of from six to twelve weeks the individual may now leave the hospital with some assurance of success. His case is now in the hands of the out-patient department which, by timely assistance and advice, may greatly aid in the prevention of relapse.

Clinical Department.

REPORT OF A CASE OF CONGENITAL ALOPECIA.

By J. Harper Blaisdell, M.D., and A. R. Cunningham, M.D., Boston.

Pathology by C. J. White, M.D., Boston.

This case of congenital alopecia appeared at the Children's Medical Clinic of the Boston Dispensary, where it was observed over a period of a month. At this time the mother, knowing that there were no prospects of improvement under treatment, quite excusably neglected to continue her visits. During this time, however, we secured an x-ray of the jaw, a Wassermann test, which was negative, and a fundus examination, also negative. We wish to thank Dr. Charles J. White, professor of dermatology at the Harvard Medical School, for his courtesy in contributing a report of his examination of a biopsy which we took from the patient's scalp.

Stelwagon states that "Congenital alopecia is a rare condition in which the hair may be patchy, or the general hair growth may be scanty, incompletely grown, or downy in character. In exceptional instances the hair has been entirely wanting, and in such cases it is usual also to find defective development of other structures, such as teeth and nails, the latter more rarely." J. N. Hyde[1] and J. Kingsbury[2] have published comprehensive articles, including analyses of the literature on the subject.

This patient was four years old, white, and has one sister not seen, but stated by the mother to be normal in the development of the hair, teeth and nails. The father and mother are well and know of no other similar case in the family. The patient's mother had one miscarriage one year before his birth and one other child, who died from an unknown cause ten minutes after birth. His maternal grandmother died of cancer. There is no case of tuberculosis or insanity in either branch of the family. The patient was full-term and breast fed; he has been delicate always, and had diphtheria two years ago. He was brought to the clinic because he had only four teeth and almost no hair and in addition he "catches cold easily" and "wets the bed." He was a fairly well developed and nourished boy of normal intelligence. There were four apparently healthy teeth, all in the upper jaw, as seen in the plate. Otherwise there was nothing unusual or abnormal about the mouth or throat, heart, lungs, abdomen, or extremities except for the condition of the skin. Both testicles were descended and there were no herniae.

The report from the dermatological clinic is as follows: The boy had the appearance of an elfish old man that is so characteristic of those without hair, either on the scalp or face. This resemblance was heightened by the lack of teeth and the sunken-in lips.

The hair on the scalp was extremely scanty and consisted of thin, straight shafts about half an inch

apart and one inch long. The scalp itself appeared to be decidedly parchment-like owing to the lack of subcutaneous fat. The eyebrows were represented by six to ten small lanugo hairs. The nails on the fingers and toes were slightly thickened and friable and suggested the conditions so commonly found in the ichthyotics of slight degree. The skin of the entire body presented a mild xerodermatous condition that was accentuated on the face, hands and the extensor surfaces. The horny layer was increased and furfuraceously scaling. The natural lines of cleavage were pronounced. An interesting feature was the absolute lack of any hair follicles and the extreme dryness of the skin as the result of the deficiency in the sebaceous and sweat glands. The child suffered from no subjective symptoms.

The pathological report of Dr. White is as follows:

EPIDERMIS.

The stratum corneum is extremely thin and for long stretches packed into a solid ribbon which for the most part exhibits an affinity for the nuclear stain of polychrome methylin blue.

The stratum granulosum as a normal layer is for the most part wanting. A differentiation between this layer and that of the true spinous cells is very hard to demonstrate; in other words, it is difficult to draw any definite line whatever, for large and small, more or less round cells with centrally placed and well characterized, solidly staining nuclei, surrounded with dense zones of acid-staining granules abound at all levels down to the lower half of the rete.

The stratum spinosum exhibits in its germinate layer a typical picture, but above this level the true spinous cells are of irregular size and emplacement. The layer as a whole is of normal thickness.

CORIUM.

The papillary layer is not remarkable but varies in height in different parts of the section.

The reticular layer presents an extraordinary picture. Great rarefaction of the fibrous tissue is patent everywhere; in fact there is little to choose in density between the two layers of the corium.

The really important and striking features of the case, based on a careful study of ten and eleven serial sections respectively from different parts of the skin, are the following: there are comparatively few vessels; there is one arrector pili muscle; there is one abortive follicle; there is no hair shaft; there are no sebaceous glands; and there are no sweat glands.

REFERENCES.

[1] Journal Cutaneous Diseases, 1909, Vol. xxvii, p. 1.
[2] Journal Cutaneous Diseases, 1906, Vol. xxiv, p. 419.

Book Reviews.

The Harvard Medical School and Its Clinical Opportunities. Compiled and Edited by Leroy E. Parkins, A.B. Boston, 1916.

A small volume of ninety pages attractively bound in red, giving brief historical accounts of the Harvard Medical School and its coöperating hospitals, has been compiled by a student of this medical school. It traces the history of the medical school since its inception in 1782, and gives a careful account of the present buildings, with an exterior and an interior picture and a ground plan. Then follow brief statements of seventeen hospitals situated in Boston and its vicinity whose rich clinical material is available for the use of the medical school, with a picture of each. A statement of the Boston Medical Library and a statistical table correlating the information about the hospitals complete the volume. The book presents in convenient form a simple and concise statement of the advantages for medical study which Boston, and more particularly the Harvard Medical School, offers, combined with a record of the historic interest which centers around many of its old hospitals and medical centers, and as such will, no doubt, find a useful place.

The Practice of Urology. A Surgical Treatise on Genito-Urinary Diseases, including Syphilis. By Charles H. Chetwood, M.D., LL.D., F.A.C.S.; Professor of Genito-Urinary Surgery, New York Polyclinic. Profusely Illustrated. Second Edition. New York: William Wood and Company. 1916.

The first edition of this book was published three years ago and was reviewed at length, and in commendatory fashion, in this Journal. The present (second) edition is practically identical with the first, some slight changes and additions having been made in the section devoted to the teaching of cystoscopy, and in the technic of various operations. The author has added also a section on "local anesthesia." The general appearance of the book is unchanged, and this second edition merits the approbation and success which its first edition deserved and obtained.

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MEDICAL EXPLOITATION OF THE IMMIGRANT.

IMMIGRANTS offer a rich field for medical exploitation. The foreigner is usually ignorant, he speaks little or no English, and he is unaccustomed to our American ways. Illness, so menacing to any man whose health is his sole capital, has especial terrors for the friendless foreigner. He is, therefore, an easy dupe for the irregular practitioner. Moreover, when he has been fleeced, his shame at being a "greeny" prevents his complaining to the proper authorities, even if he knows who they are. He simply accepts his loss, leaving the exploiter free for further plundering.

Three hundred immigrants crowded the Magistrate's Court at Mulberry Street in New York one morning not many months ago. They had chanced to hear that their doctor had been arrested, and had come to see whether there was any chance of getting their money back. One of the defendants had behind him a record of twenty years' "successful practice," with institutions in a number of cities, and a record of 250,000 patients on his books. Mr. George W. Whiteside, counsel to the Medical Society of the County of New York and prosecuting attorney, stirred by his long day in court among the helpless victims of the system, declared that "the immigrant's property, his health, his life, are placed in jeopardy by his natural handicaps." He "ought to be the natural ward of the State."

Two bills before the present General Court of Massachusetts are aimed at this evil. One is intended to forewarn the immigrant, the other to eliminate the irregular practitioner. Immigrant conditions have been thoroughly investigated in Massachusetts by a Commission of Inquiry, whose report was published early in 1914. The report contained an account of the present situation, describing the many ways in which the immigrant is exploited and embittered toward the country which, for our own sakes, we ought to teach him to love. It concluded by recommending the establishment of a board whose duty it should be to guard the immigrant from exploitation and to provide him with the information and guidance which would fit him to become a loyal and intelligent American citizen. Senate Bill No. 149 provides for the creation of such a board. The Boston Chamber of Commerce, through its Committee on Americanization of the Immigrant, is urging this bill.

Should such a board be created, one of its important duties would be to protect the immigrant from medical exploitation. To accomplish this, the board must have the coöperation of the Massachusetts Board of Registration in Medicine. The second bill—House 124—would provide this coöperation. It would clothe the Board of Registration in Medicine with power to do what the law already requires it to do—to protect the public against medical exploitation. It would authorize this board to withdraw the license to practise from any registered practitioners who have failed to conform to proper medical standards as already determined by the laws of the Commonwealth. The rights of the practitioner are carefully protected by giving him all proper hearings and other safeguards. This supplementary bill, which is introduced by the Board of Registration in Medicine, merely confers the power which logically should belong to such a board if it is to protect the poor, the ignorant, and the gullible citizen from the many forms of deception and exploitation that are constantly cropping out in all parts of the State.

For the good name of the medical profession, no less than for the protection of the ignorant public, every physician is urged to consider carefully these two bills and to do all that he can to secure their passage.

SUDHOFF'S COPENHAGEN CODEX.

THE ever-interesting question of the origin of syphilis has been touched on more than once in recent numbers of the JOURNAL, and many readers will remember Dr. Downing's scholarly article and able arguments against the so-called American, or rather Columbian, origin of syphilis in Europe.

The work of Karl Sudhoff in this connection is not generally known in America, though Garrison gives a most interesting account of it in his History of Medicine. Sudhoff is professor of medical history at Leipzig, and director of the Institute of Medical History. For years he has made an intensive study of the origin of syphilis, and combats vigorously the well-known views of Iwan Bloch, who is a firm believer in the Columbian origin of syphilis in Europe. Sudhoff in his researches a few years ago found a mansucript in a library in Copenhagen of the greatest interest in this connection. The article describing this ancient manuscript is entitled, "Mal Franzoso in Italien in der ersten Hälfte des 15. Jahrhunderts," and is of absorbing interest, as it seems to prove definitely that syphilis was present in the Old World before Columbus discovered America in 1492.

The manuscript was written in old Italian, and experts in the interpretation of such papers in Florence definitely fixed the handwriting as belonging to the first part of the fifteenth century. On the manuscript were marginal notes in a different hand, and the date "1465" in Roman numerals.

The manuscript contains long lists of receipts for various ailments, among them being the following two: "elactuario optimo al mal Franzoso," and "Per fare siropi da male franzoso." These prescriptions, as pointed out by Garrison, contain many of the medicinal substances used by the early writers on syphilis.

The chain of evidence so forcefully woven by Sudhoff in his masterly article is certainly strong proof of the presence of a certain amount of syphilis in Europe before Columbus' return from America.

EXTENSION COURSES OF THE HARVARD MEDICAL SCHOOL.

IN the issue of the JOURNAL for Oct. 19, 1916 (Vol. clxxv, p. 578), we called attention editorially to the establishment of a plan of extension courses by the coöperation of the local hospitals whereby opportunities for graduate study might be carried to the various medical centers of Massachusetts at a distance from Boston. The first series of these extension courses was given at Springfield, beginning in November, 1916, and has proved a noteworthy success. A second similar series is planned to be given in Worcester during the months of February, March and April.

It will consist of lectures upon selected subjects of special interest to the general practitioner, which will be supplemented by clinical and laboratory demonstrations, made possible by the coöperation of the Worcester Hospitals and their staffs. When possible, case histories will be mailed in advance of each lecture to those taking the course, this being in charge of the Chief Monitor and the Special Monitors for each lecture.

The exercises will be held each Wednesday, beginning January 31, at 7.30 in the evening, and will be of about two hours' duration, the clinical instruction either preceding or following the lecture.

The details of the course are as follows:

1. Dr. Frederick T. Lord, "Diseases of the Lungs and Pleura." Two lectures, on January 31 and February 7. Dr. Ray W. Greene, Special Monitor.
2. Dr. Channing Frothingham, Jr., "Diagnosis, Functional Tests and Treatment of Chronic Nephritis." Two lectures, on February 14 and 21. Dr. L. C. Miller, Special Monitor.
3. Dr. Franklin W. White, "Diagnosis and Treatment of Diseases of the Stomach." Two lectures, on February 28 and March 7. Dr. A. M. Shattuck, Special Monitor.
4. Dr. Joseph H. Pratt, March 14, "Heart Failure, Its Diagnosis and Clinical Aspects."

March 21, "Modern Views as to the Treatment of Heart Disease." Dr. T. J. Foley, Special Monitor.

The first two lectures have been already given at the Worcester City Hospital. The remainder will be at places subsequently to be announced. It is a great satisfaction to chronicle the success of the first attempt in university extension work by the Harvard Medical School and to call attention to its future continuance in Worcester and in other cities of the Commonwealth.

It was originally intended to limit the course to thirty, but the Trustees felt that such a limitation was contrary to the spirit of an institution supported by the public. The wisdom of that course was immediately justified by a flood of applications for enrollment, showing conclusively that the profession in this vicinity feels the need of such easily available post-graduate instruction. Evidently the liberal policy of the Graduate School of Medicine of Harvard University in forwarding the scheme of extension centers, finds ready appreciation and is destined to prove of real service to the medical profession, and through them to the community.

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THE PERIL OF SMALLPOX.

In last week's issue of the Journal we published, too late for editorial comment, a letter from the president of the Massachusetts Medical Society, calling attention to the continued menace of smallpox from the presence of unvaccinated persons in the community, and the consequent importance and duty for the medical profession to combat the annually recurring attempts to secure the passage of anti-vaccination legislation in this Commonwealth. An excellent and timely illustration in point was the occurrence, on January 28, of a small localized epidemic of seven cases in an unvaccinated family of nine at Stonington, Conn. This family was exposed to a subsequently recognized case of the disease at the home of a friend in a neighboring town, which was visited by two members of the family in question. Between the time of their infection and the recognition of the disease in the Stonington family, a large number of contacts ensued, which has resulted in the necessity of closing the local schools indefinitely, cancelling church services and public meetings, revaccinating a large number of persons, and placing others under isolation and quarantine. This entire labor, expense and interference with daily occupation might have been prevented by original, compulsory vaccination of the unprotected family. Such episodes are bound constantly to recur in any community not completely protected by vaccination, and the extent and severity of ensuing epidemics depend wholly on the number of unvaccinated persons allowed to exist. If the latter were the only sufferers, their misfortune might be considered in the light of retributive justice, but since the remainder of the community must also suffer inconvenience and expense in addition to the loss of efficiency of the unprotected victims, the reasonable justice and desirability of compulsory universal vaccination become obvious. Physicians everywhere should exert their educational and professional function to prevent the abrogation of our present vaccination laws by the passage of anti-vaccination legislation.

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MEDICAL NOTES.

Expedition by Dr. Pearce.—It is announced that on January 15 Dr. Richard M. Pearce, adviser in medical education to the International Health Board of the Rockefeller Foundation, sailed on an expedition to Argentina and Uruguay to study medical conditions in those countries.

Gifts for Medical Education.—It is announced that the Jefferson Medical College of Philadelphia has received from Miss Anna J. Magee the sum of $150,000, to endow the Magee professorship for the practice of medicine and clinical surgery. During the past year the college has also received $100,000 from Mr. Daniel Baugh, to establish the provost professorship of therapeutics, and an equal sum from other donors to endow the Samuel D. Gross professorship of surgery. It is understood that these gifts were intended to make unnecessary the merging of the Jefferson Medical College with the University of Pennsylvania Medical School.

The University of Chicago has recently received from Mr. C. K. G. Billings and other members of the Billings family $1,000,000 towards the endowment of its medical school. This money will be used to equip a hospital in connection with the school.

American Society for Pharmacology.—The eighth annual meeting of the American Society of Pharmacology and Experimental Therapeutics was held at the Cornell Medical School, New York City, on December 28 to 30, 1916. Dr. Reid Hunt of Boston, professor of pharmacology and therapeutics in the Harvard Medical School, was elected president for the ensuing year.

American Electro-Therapeutic Association.—At a recent meeting of the board of trustees of the American Electro-Therapeutic Association, it was voted that the next annual meeting of the Association would be held on September 11, 12 and 13, 1917, at Atlantic City, N. J.

Poliomyelitis in West Virginia.—A report from Fairmount, W. Va., on January 17, states that there is a sporadic epidemic of poliomyelitis in that town and in the adjacent communities of Elkins and Grafton. Up to that date, there had been forty-nine cases and nine deaths. The local public schools have been closed, and general quarantine of affected households established.

London Death Rates in November.—Statistics recently published show that the total death rate of London during the month of November, 1916, was 14.5 per thousand inhabitants living. Among the several districts and boroughs, the highest rate was 19.3, in Bermondsey, a populous region on the south bank of the Thames; and the lowest was 10.1, in Hampstead, an open district on the north.

Changes in Cost of Drugs.—Report from New York on January 9 records a further advance in the cost of opium and various of its preparations.

"The sensational advance, amounting to $1 per pound, on all varieties of opium, has brought prices to the highest point since prior to 1870. Druggist's quality gum has been advanced to $14.50, and powdered and granular grades to $15.50 per pound. Single ounce quotations for morphine have been advanced as follows: acetate, $7.50; sulphate, $7.50 to $7.70; hydrochloride, $7.50; heroin, $9.55; and alkaloid, $10.60. Sulphate and hydrobromide of codeine have advanced to $8.80; phosphate and salicylate to $8.25; nitrate, hydrochloride and acetate to $9.85, and alkaloid to $10.95. These were single-ounce quotations. Stocks of opium have shrunk to a low ebb in this country, and unprecedently high prices are prevailing, despite the fact that domestic consumption is at the lowest point on record."

Further report on January 15 notes also a reduction in the price of bismuth and its salts.

"Manufacturers of bismuth salts have just announced sharp reductions in all preparations, excepting bismuth sub-gallate, which has advanced 5 cents per pound to a basis of $3.30 to $3.65 per pound, owing to the increasing scarcity of gallic acid, which has been firmly maintained by makers at $1.28 to $1.30 because of scarcity of raw materials and increasing difficulty of domestic production. Freer offerings of bismuth metal, which has been currently quoted in the trade at $3.10 per pound, are responsible for the reductions. New prices show a decline in bismuth subnitrate of 20 cents to $2.90 to $2.95 per pound; a 15-cent reduction in bismuth subcarbonate to $3.25 to $3.50 per pound. Oxide hydrate of bismuth was also reduced 15 cents per pound, while bismuth subsalicylate, nitrate and crystals were reduced 35 cents, to $3.65 per pound; a 25-cent reduction was named in bismuth sub-iodide to a basis of $5 per pound; bismuth salicylate was reduced 50 cents, to $3.15 per pound; while bismuth oxychloride was unchanged at previous quotations."

Control of Hog Cholera.—The United States House of Representatives has recently passed a bill to regulate the treatment of hog cholera in this country by authorizing the department of agriculture to license establishments for the manufacture of antitoxins and sera for the treatment of this and other diseases of domestic animals.

United States Army Death Rate.—The annual report of the chief surgeon of the southern department of the United States Army, published on January 11, at San Antonio, Texas, states that during the last seven months of 1916 there were only 274 deaths among the 150,000 national guardsmen and regular troops mobilized on the Mexican frontier. Of these, 166 were due to disease and 108 to violence. Of the latter, 47 were due to gunshot wounds.

There have been 29 accidental deaths, 19 suicides, 10 drownings and three fatal sunstrokes. Out of the 166 deaths from disease, 41 were due to pneumonia. Thirty-one were from abdominal disease, appendicitis, and internal troubles of that nature. Dysentery claimed eleven men, but only one death from typhoid fever has occurred during the seven months.

Ophthalmological Service at Bellevue Hospital.—An ophthalmological service has been added to the other departments of Bellevue Hospital, New York. It is located in the new surgical pavilion but is entirely distinct from the rest of the hospital, having its own operating, examining and dressing rooms, a staff of attending surgeons, special internes and nurses; its capacity for the present will be 50 beds. The service is in charge of Dr. Charles H. May, attending surgeon, who will have as his principal assistants Drs. Julius Wolff and John M. Wheeler.

An Important Supreme Court Decision.—On January 8, the United States Supreme Court at Washington, D. C., affirmed the refusal of the federal court in California to enjoin enforcement of the California Medical Practice Law which requires the licensing of so-called drugless practitioners but exempts Christian Scientists.

California's so-called "drugless healer" laws, enacted in 1913, were attacked as unconstitutional in two injunction suits of a Los Angeles chiropractor, and a Los Angeles ophthalmologist. No Christian Scientists were parties to the suits, but have been watching them because of the statutes' exemption of Christian Science and other "prayer practitioners" from examination and licensing by the state medical board.

The laws, designed to suppress quack and fake healers, require osteopaths, neuropaths, chiropractors and other so-called drugless healers to have certain physiological knowledge.

Exemption given Christian Science was attacked as unconstitutional in the injunction suits. It was contended that the law gives Christian Scientists a monopoly in "prayer practice," discriminates against drugless practitioners of every school of drugless healing in favor of those using prayer only, is class legislation, and an arbitrary exercise of the state's "police powers."

The California laws, the defending authorities asserted, permit all persons whether drugless practitioners, physicians or Christian Scientists, to treat the sick with prayer. The statutes, they contended, are designed to regulate treatment by material means.

That the state was without power to determine "the particular religious form or ceremony which shall be employed in drugless treatment of disease" or to "distinguish between different religious forms, rites and ceremonies" was contended by those attacking the laws.

In upholding the decision of the California Court the Supreme Court at Washington also dismissed an appeal attacking the validity of the California law regulating the practice of optometry.

London Death Rates in December, 1916.—Statistics recently published show that during the month of December, 1916, the total death rate of London was 22.6 per thousand inhabitants living. Among the several districts and boroughs, the highest rate was 28.8 in Finsbury, a crowded central slum, and the lowest was 14.7, in the financial district of the city.

Award of Warren Triennial Prize.—It is announced that the Warren Triennial Prize for 1916, consisting of $500, has been awarded to D. Nöell Paton of Glasgow, Scotland, for his essay, entitled "The Parathyroids."

United States Leper Hospital.—A bill appropriating $250,000 for a national sanatorium for lepers, already passed by the House, was passed today by the Senate. The institution is to be administered by the public health service, and officers engaged in the work will be given pay and a half.

Proposed Unwarrantable Legislation.—Report from Pierre, S. D., on January 29, states that a bill has been introduced into the legislature of that State providing that every vermiform appendix removed by a surgeon in South Dakota must be sent to the state laboratory for examination, after which it will be returned to the patient from whom it is removed, with a pathological report. If the appendix is not diseased, the patient is released from all financial obligation to the surgeon who removed it.

EUROPEAN WAR NOTES.

Medical Service in the Somme Campaign.—In the official report recently made by Field Marshall Sir Douglas Haig of the fighting during the past season in the Somme campaign occur the following paragraphs relative to the work of the medical services.

"The losses entailed by the constant fighting threw a specially heavy strain on the medical services. This has been met with the greatest zeal and efficiency. The gallantry and devotion with which officers and men of the regimental medical service and field ambulances have discharged their duties is shown by the large number of the R. A. M. C. and medical corps of the Dominions who have fallen in the field. The work of the medical services behind the front has been no less arduous. The untiring professional zeal and marked ability of the surgical specialists and consulting surgeons combined with the skill and devotion of the medical and nursing staffs, both at the casualty clearing stations in the field and the stationary and general hospitals at the base, have been beyond praise. In this respect also the director-general has on many occasions expressed to me the immense help the British Red Cross Society have been to him in assisting the R. A. M. C. in their work.

"The health of the troops has been most satisfactory, and during the period to which this despatch refers there has been an almost complete absence of wastage due to disease of a preventable nature."

War Relief Funds.—On Feb. 2 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund	$251,506.88
French Wounded Fund	191,357.38
Armenian Fund	140,819.47
Serbian Fund	108,093.06
French Orphanage Fund	78,218.50
Permanent Blind Fund	68,029.60
Surgical Dressings Fund	60,835.12
Italian Fund	29,289.26
Russian Refugees' Fund	9,605.79

BOSTON AND NEW ENGLAND.

Gift to Middlesex College—It is announced by Dr. Charles E. Buck, treasurer of the board of trustees of the Middlesex College of Medicine and Surgery of Cambridge, Mass., that that organization has recently received the sum of $350,000 from an anonymous donor "for the enlargement of the college and for scholarships."

Judge Baker Foundation.—There has recently been established in Boston the Judge Harvey H. Baker Foundation, organized to carry on the work of the late Judge Baker of the Boston Juvenile Court. It is announced that Dr. William Healy, who since 1910 has been at the head of the Chicago Juvenile Psychopathic Institute, has been appointed director of the Judge Baker Foundation and will assume his duties on April 1, 1917. Dr. Healy will work in conjunction with Judge Frederick P. Cabot, now in charge of the Boston Juvenile Court, and will make psychologic examinations of children referred to him by the court.

Rhode Island Medical Journal.—With its issue of November, 1916, the *Providence Medical Journal*, which has been in existence since 1899, ceased to exist under that name, but in January, 1917, its publication was resumed under the name of *The Rhode Island Medical Journal* as the property and official organ of the Rhode Island Medical Society. The new journal has conformed to the standard set by other state-owned journals, has increased the size of its page to a double instead of a single column, and has made its title page and contents uniform with other state journals. The Boston Medical and Surgical Journal is glad to extend its cordial greeting to this valued and established publication under its new name and function.

Hospital Bequests.—The will of the late John Martin of Somerville, Mass., which has been filed at the East Cambridge Probate Court, contains bequests of $1000 each to the St. Mary's Lying-in Hospital and the Free Home for Consumptives, Dorchester, and the Holy Ghost Hospital, Cambridge.

The will of the late George Morrell of Sharon, Mass., which has been filed in the Norfolk Probate Court at Dedham, Mass., establishes a trust find of $25,000 for the Massachusetts Homeopathic Hospital; two trust funds of $30,000 each are also established for personal beneficiaries, after whose death without issue a part of the residue of these funds is to revert to the Massachusetts Homeopathic Hospital, the Industrial School for Crippled Children and the Children's Hospital, Boston.

Boston Municipal Court Medical Service.—On November 1, 1916, the municipal court of Boston officially established a medical service in conjunction with the court and made the following appointments to the service: Medical director, Dr. V. V. Anderson; assistant physician, Dr. Christiana Leonard; secretary, Miss Gertrude Barkley.

Week's Death Rate in Boston.—During the week ending January 27, 1917, the number of deaths reported was 272, against 323 for the same period last year, with a rate of 18.19, against 22.15 last year. There were 34 deaths under one year of age, against 36 last year, and 112 deaths over 60 years of age, against 118 last year.

The number of cases of principal diseases were: diphtheria, 68; scarlet fever, 29; measles, 74; whooping cough, 3; typhoid fever, 1; tuberculosis, 59.

Included in the above were the following cases of non-residents: diphtheria, 17; scarlet fever, 17; measles, 1; tuberculosis, 3.

Total deaths from these diseases were: diphtheria, 6; scarlet fever, 1; measles, 1; tuberculosis, 17.

Included in the above were the following deaths of non-residents: diphtheria, 2; tuberculosis, 1.

Free Hospital for Women.—The recently published forty-first annual report of the Free Hospital for Women, Brookline, Mass., covers the year from October 1, 1915, to October 1, 1916. During this time 882 patients were admitted to the hospital and of this number 744 were operated upon. Of the number discharged 527 were cured and 113 relieved. There were six deaths. The pathological laboratory examined 1935 specimens and 1560 slides. The training school has graduated sixteen nurses. The out-patient department gave 8124 consultations and received 1920 new patients. Of patients coming to the out-patient department 829 were referred to the hospital.

Hospital Bequests.—The will of the late Mrs. John Hobart of East Bridgewater, Mass., who died recently in Washington, D. C., contains bequests of $1000 each to the New England Hospital for Women and Children and Boston Nursery for Blind Babies.

The will of the late David G. Pratt of Plymouth, Mass., which was admitted to probate on January 25, contains bequests of $15,000 each to the Massachusetts General Hospital, the Massachusetts Homeopathic Hospital and the Massachusetts Tuberculosis Sanatorium at Lakeville, the income to be used for the maintenance of free beds in the use of which citizens of Middleboro, Mass., are to have first preference.

Boston City Hospital.—The recently published fifty-second annual report of the trustees of the Boston City Hospital records the activities and progress of that institution for the year ended January 31, 1916. During this period 16,074 patients were treated at the hospital at an average weekly cost of $16.36.

"There was collected from paying patients $94,393.10 for the hospital proper and $45,164.90 for the South Department. 'This money was paid into the city collector's office and credited by them to the general revenue of the city. If this amount were credited to the hospital appropriation it would reduce the per capita cost per week to the city $13.12 in the main hospital and to $7.34 in the South Department.'

"The total expenses of the hospital department were $725,045.43, but the net cost to the city for maintaining the main hospital was only $381,305.14. The maximum number of patients in the hospital proper on any one day was 662, as compared with 664 in the previous year. The minimum number was 428, in comparison with 457 for the previous year.

"There were treated in the various out-patient departments 39,351 patients, at a cost of $32,645.46. A total of 106,698 received the benefit of the hospital in all departments."

Memorial Resolutions.

EDWARD M. BUCKINGHAM, M.D.

THE senior staff of the Boston City Hospital has reason to regret the death of Dr. Edward M. Buckingham, who died on December 23d last.

He served for many years on the medical side and for eight years performed the arduous duties of secretary. His services were particularly valuable at the time of the Spanish war. The City Hospital received a large number of the invalid soldiers who were sent to this city for treatment. The typhoids, malarias, and digestive troubles were of an especially severe type and called for especial care. Dr. Buckingham devoted himself whole-heartedly to the work and published a very excellent report in regard to their maladies when the last soldier was discharged. Although several years have passed since his retirement from active connection with this institution, his valuable work is still remembered and deserves this expression of our appreciation.

We wish to extend to his family our sympathy in their loss and to assure them that their loss is also ours.

CHARLES F. WITHINGTON, M.D.

CHARLES FRANCIS WITHINGTON died January seventh, nineteen hundred and seventeen, and by his death the staff of the Boston City Hospital loses one of its most devoted members. He was visiting physician from eighteen hundred and ninety-two until nineteen hundred and fifteen, when he was appointed a consulting physician.

His long term of service was marked by unfailing interest in the welfare of the hospital and untiring devotion to his patients. Possessed of unusual knowledge, his opinions were given only after careful examination and attention to the physical signs and symptoms presented by each case. His tact and judgment made him a wise counsellor in the conduct of staff business, and many improvements were inaugurated under his guidance. All who had the privilege of working with him appreciated his keenness of mind, ability as a teacher and skill as a diagnostician.

Always interested in public health measures, Dr. Withington, when relieved of active hospital duty, devoted himself assiduously to the study of legislative acts affecting the welfare of the community and the profession.

Miscellany.

MASSACHUSETTS STATE DEPARTMENT OF HEALTH.

RÉSUMÉ OF COMMUNICABLE DISEASES FOR DECEMBER, 1916.

GENERAL PREVALENCE. The incidence of all the common communicable diseases continues to maintain a lower level than for the corresponding month of last year. This drop is particularly noticeable for typhoid fever, which has been below the average throughout the year.

EPIDEMICS AND OUTBREAKS. *Anterior Poliomyelitis.*—The epidemic of infantile paralysis apparently is now definitely over. Sporadic cases, however, still continue to crop out in widely separated communities.

Diphtheria.—Several outbreaks of this disease have occurred during the month. Gardner reported fifty cases, which were confined to one school. Investigation showed that the source of infection was probably due to contact with unrecognized carriers and active cases. Wholesale culturing and immunizing checked the spread of the disease. Fourteen cases were reported from Webster. These proved not to be milk-borne and were not confined to any particular locality or school. A small outbreak occurred in Holyoke in a hospital ward. Energetic measures were taken and there was no further spread.

Scarlet Fever.—An unusual number of cases of this disease was reported from Westfield during December, totalling 23 and making 59 in all since September. Carelessness on the part of certain families allowed the infection to get a start. The spread was apparently due to contact with unrecognized cases. The city of Worcester showed a total of 46 cases during the month of December, exactly double its endemic index. Unrecognized carriers were, apparently, the cause for the spread of this disease here.

Measles.—A considerable outbreak of this disease is in progress in Fall River. Other cities and towns, as well, share in this undue prevalence, notably Lowell, Framingham, Ayer, Reading, Salisbury, Leominster, Malden and Medford.

DISTRIBUTION. *All Communicable Diseases.*—Total cases: Nov., 1916, 3592; Dec., 1916, 4704; Dec., 1915, 5403.

Case rate per 100,000 population: Nov., 1916, 95.3; Dec., 1916, 124.7; Dec., 1915, 146.5.

COMMON DISEASES. *Diphtheria.*—Total cases: Nov., 1916, 612; Dec., 1916, 775; Dec., 1915, 1019.

Case rate per 100,000 population: Nov., 1916, 16.2; Dec., 1916, 20.3; Dec., 1915, 27.6.

Measles.—Total cases: Nov., 1916, 714; Dec., 1916, 1054; Dec., 1915, 1310.

Case rate per 100,000 population: Nov., 1916, 18.9; Dec., 1916, 27.9; Dec., 1915, 35.5.

Cities and towns which have markedly exceeded their endemic index:

Cambridge	(29)	51
Canton	(0)	8
Quincy	(5)	12
Everett	(5)	16
Methuen	(1)	8
Webster	(1)	17
Gardner	(4)	53
Chicopee	(6)	12
Ludlow	(1)	9
W. Springfield	(0)	6
Fall River	(5)	240
Malden	(6)	33
Reading	(1)	58
Salisbury	(0)	32
Lowell	(10)	109
Medford	(4)	36
Framingham	(3)	134
Ayer	(0)	57
Leominster	(2)	24

Scarlet Fever.—Total cases: Nov., 1916, 390; Dec., 1916, 578; Dec., 1915, 845.

Case rate per 100,000 population: Nov., 1916 10.3; Dec., 1916, 15.3; Dec., 1915, 22.9.

Typhoid Fever.—Total cases: Nov., 1916, 116; Dec., 1916, 79; Dec., 1915, 149.

Case rate per 100,000 population: Nov., 1916, 3.1; Dec., 1916, 2.1; Dec., 1915, 4.0.

Whooping Cough.—Total cases: Nov., 1916, 202; Dec., 1916, 170; Dec., 1915, 760.

Case rate per 100,000 population: Nov., 1916, 5.3; Dec., 1916, 4.5; Dec., 1915, 20.6.

Tuberculosis, Pulmonary.—Total cases: Nov., 1916, 521; Dec., 1916, 678; Dec., 1915, 572.

Case rate per 100,00 population: Nov., 1916, 13.8; Dec., 1916, 17.9; Dec., 1915. 15.5.

Tuberculosis, Other Forms.—Total cases: Nov., 1916, 44; Dec., 1916, 43; Dec., 1915, 50.

Case rate per 100,000 population: Nov., 1916, 1.2; Dec., 1916, 1.1; Dec., 1915, 1.3.

Cities and towns which have markedly exceeded their endemic index:

Dighton	(0)	5
Taunton	(3)	11
Milton	(3)	10
Everett	(8)	17
Woburn	(1)	10
Natick	(1)	10
Westfield	(2)	23
Greenfield	(2)	17
Montague	(2)	10
Springfield	(10)	30
Marion	(0)	5
Lynn	(4)	9
Haverhill	(8)	17
Needham	(0)	39

Rare Diseases.—Anthrax was reported from North Adams (1) and Winchester (1).

Cerebrospinal meningitis was reported from Boston (2), Greenfield (1), Hingham (1), Malden (1), Marlboro (1), Salem (1) and Springfield (2).

Dog-bite (by known or suspected rabid dogs) was reported from Brockton (1), Chelsea (1), Lowell (2), and Needham (1).

Dysentery was reported from Boston (5), Clinton (1), and Fall River (1).

Malaria was reported from Newton (2) and Springfield (1).

Pellagra was reported from Taunton Insane Hospital (1) and from Tewksbury State Infirmary (1).

Septic sore throat was reported from Barnstable (9), Boston (3), Cambridge (1), and Westfield (1).

Smallpox was reported from Boston (1).

Tetanus was reported from Boston (1) and Natick (1).

Trachoma was reported from Attleboro (1), Boston (6), Chelsea (1), Lawrence (1), Salem (1) and Taunton (1).

Occupational Diseases.—Reported by State Board of Labor and Industries:

DISEASE	OCCUPATION	SEX	AGE	COLOR
Lead poisoning	Painter	M.	39	W.
Lead poisoning	Painter	M.	41	W.
Anthrax	Tanner	M.	30	W.
Lead poisoning	Wire worker	M.	27	W.
Caisson	Lock tender	M.	38	W.
Aniline oil psng.	Tire maker	M.	30	W.
Lead poisoning	Paper hanger	M.	31	W.
Anthrax	Woolen wkr.	M.	16	W.
Lead poisoning	Linotype opr.	M.	45	W.
Lead poisoning	House painter	M.	30	W.
Lead poisoning	House painter	M.	37	W.
Lead poisoning	Wire wkr.	M.	29	W.
Anthrax	Tanner	M.	46	W.
Lead poisoning	Lead wkr.	M.	35	W.
Lead poisoning	Mills bun. boy	M.	19	W.
Lead poisoning	Painter	M.	59	C.
Lead poisoning	Ship building	M.		W.
Lead poisoning	Painter	M.	40	W.

Cases of lead poisoning, 13; cases of anthrax, 3; cases of caisson, 1; cases of aniline oil poisoning, 1; total number of cases, 18.

◆

Correspondence.

THE TREATMENT OF IMPACTED HIP FRACTURE.

New York City, Jan. 7, 1917.

Mr. Editor:—

Re-reading my letter to the Journal in the light of Dr. Cotton's reply, it appears that I did not make my position quite clear.

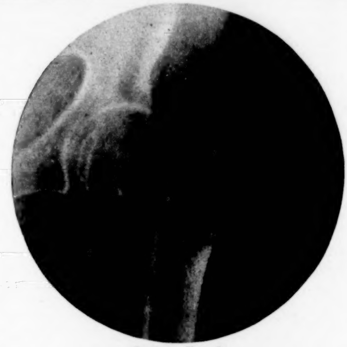
I said that "Dr. Cotton was obsessed by impaction" because he had stated "that 90% of all hip fractures were impacted and that the results were good." "That it was a crime to disturb an impaction in reasonably good position." "That complete fracture of the small part of the neck never united under routine treatment," implying that artificial impaction was the only remedy.

Far from condemning artificial impaction, I think it an important step in the right direction, since whatever may be the actual physical effects of malleting the trochanter, it is preceded by reduction of deformity and followed by fixation of the limb in abduction by a plaster spica. This I consider rational treatment, and I suggested that the same principles should be applied to the more common forms of fracture.

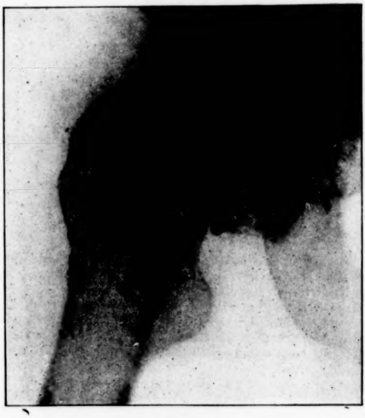
It appears, however, that Dr. Cotton would limit artificial impaction "to the rather small proportion of hip fractures that are loose or hopelessly displaced" and that he "cares nothing for the decision as to other types of fracture because they do not do badly under any form of handling."

It seems to me, on the contrary, that these other types, comprising the majority of the cases, do very badly,—if statistics of final results are to be accepted as evidence,—and primarily because the treatment is inadequate and ineffective in every particular.

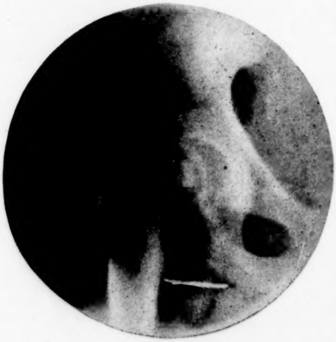
The object of treatment of any fracture is to restore the normal contour, to fix the fragments securely and to protect the weak part until function is restored. The chief dependence for security is the mutual pressure of the apposed fragments. In fracture of the neck of the femur they are of small area, lying in a lateral relation, and can be brought end to end only in a horizontal plane.



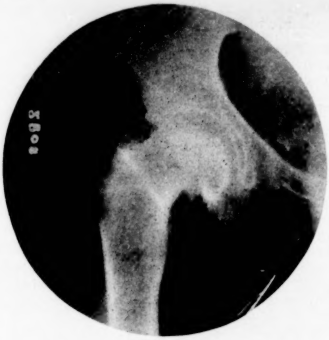
CASE 1, FIG. 1.
Intracapsular fracture in an elderly subject.



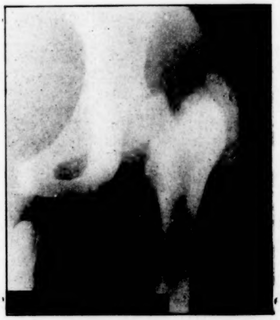
CASE 1, FIG. 2.
Taken through the plaster one month later, showing the **security** assured by bony contact.



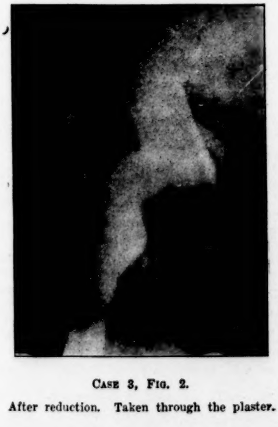
CASE 2, FIG. 1.
Epiphyseal fracture in an adolescent.



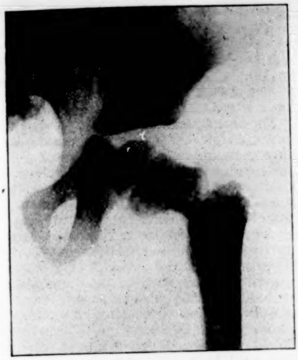
CASE 2, FIG. 2.
Final result of the abduction treatment.



CASE 3, FIG. 1.
Fracture near the base in an adult.

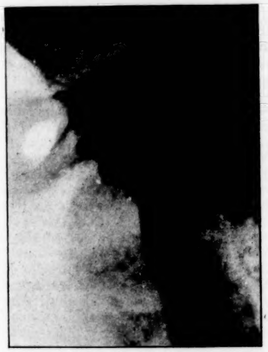


CASE 3, FIG. 2.
After reduction. Taken through the plaster.



CASE 4, FIG. 1.

Fracture at the base in a young child.



CASE 4, FIG. 2.

After reduction by the abduction method, showing restoration of the normal angle.

Complete abduction of the limb, after the shortening and outward rotation have been reduced, places the fragments in this plane, and as the capsule is attached about each fragment, the tension incidental to abduction must align them and finally force a contact. In this attitude the muscles are either relaxed or so changed in direction that they are powerless as agents of deformity, and it is only necessary to apply a long plaster spica to hold the limb in complete abduction and complete extension, to maintain this internal splinting and security.

However much the exact position of the fracture may concern prognosis, the principles of treatment are identical.

It should be self evident that the less the capacity for repair, the more essential is accurate apposition and mutual pressure, since repair in fracture of the small part of the neck proceeds in great degree from the cancellous structure unaided by external callus.

The surgeon who treats fracture of the neck of the femur should be held responsible for the opportunity for repair, as it has been defined, for although opportunity may not assure success, want of opportunity makes failure inevitable.

The abduction method from this point of view has very great advantages aside from its technical adequacy. It permits verification of the position by x-ray examination through the plaster at the time of operation and at intervals thereafter, and, in contrast with any form of traction, it is under the single control of the one who is responsible for the result.

I have always considered the most important of my "alleged data" to be the exposition of the treatment itself, because its adaptation to the mechanism of the joint is as exact as that of Bigelow for the reduction of dislocations. I have therefore been at pains in all the papers that I have written, to demonstrate the method by diagrams and to present cases illustrating, primarily, its comprehensive effectiveness and its range of practicability.

Dr. Cotton has informed the members of the Massachusetts Medical Society that complete abduction is unnecessary although "the abduction position is desirable because it obviates undesirable muscle-contractures." He does not believe "that abduction really locks the fracture, whether by leverage on the acetabular rim or by capsular tension" and finds it "horribly hard to follow an allegation that is so inconstant." I can aid him in his difficulty. He has confounded two distinct procedures. Leverage on the acetabular rim is employed for the correction of resistant deformity of the incomplete or impacted type, including not only those cases with "extreme rotation" and those "in which there is likely to be no real use of the limb," in which Dr. Cotton is interested, but all cases in which the deformity is of a degree to embarrass function, including many of those which he thinks it "a crime to disturb." Capsular tension, on the other hand, is, as has been indicated, the chief dependence in aligning and fixing separated fragments, and its efficiency when properly applied is not a matter of opinion, since, as has been stated, it is capable of direct demonstration by x-ray examination at intervals of weeks or months.

I have said that Dr. Cotton's writings proved that he had not mastered the principles of the abduction treatment, and his letter furnishes further evidence in support of this statement.

In response to Dr. Cotton's suggestion, I present several x-ray pictures illustrating the adaptation of the abduction method to different types of fracture.

1. The locking of complete "true" fracture in a woman seventy years of age, taken through the plaster one month after the application of the treatment.

2. Epiphyseal "true fracture," a type always accompanied by extreme "rotation," reduced by leverage on the acetabular rim.

3. Fracture of the neck treated five weeks after the injury, a type in which leverage, in the sense of fixation of the inner fragment by the superior border of the acetabulum, is essential for reduction.

4. Fracture at the base of the neck in a young child. Showing the advantage of abduction in apposing the separated surfaces.

These cases demonstrate simply what I have called the opportunity for repair, for which alone the surgeon is responsible, and in my opinion there is not one of them which would not have "done badly" under conventional treatment.

This interchange of letters brings to light clearly two contrasting points of view. Dr. Cotton is aggrieved because he feels that I underestimate the relative importance of artificial impaction in a rational scheme of treatment.

I, believing as I do, that the Abduction Method is the only means, in a comprehensive sense, of applying surgical principles,—in other words, of treating fracture of the neck of the femur like other fractures, —feel that the author of a Treatise on Fractures should at least inform himself of the principles of the treatment before delivering the opinion that its proper application is unnecessary.

In this discussion, "involving the welfare of hundreds of patients," to avoid the possibility of error, I have presented Dr. Cotton's statements in his own words. I trust that if, in the forthcoming edition of his valuable book, he describes the Abduction Treatment, he will be equally scrupulous, in order that his readers may have the opportunity to judge it on its merits.

Royal Whitman, M.D.

283 Lexington Avenue.

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LONDON WAR HOSPITALS.

(From our Special Foreign Correspondent.)

Mr. Editor,—

It has been my privilege to visit, in the last few weeks, some of the larger and more important of the London war hospitals, and I am sure that a brief description of these will not be without interest to the readers of the Boston Medical and Surgical Journal. After living in or near London for a few months these military hospitals, which are purely the outgrowth of modern warfare, almost become commonplace and there is a tendency to fit them into the routine of everyday life in the same manner that the Massachusetts General or the City are a part of many of Boston's physicians' daily rounds. Yet when one looks back on a series of visits, they appear so unlike the hospitals of civil life that they do not seem to fit into the general scheme of medical life at all, but are "temporary," exactly the same as the commission which the English doctors receive in the Royal Army Medical Corps; or, more precisely, they exist, as the official record reads, "for the duration of the war." It is not unlikely, however, that they will be needed for some years after peace is declared. This group of medical institutions has sprung up in a few months to meet the pressing demands of the army in Flanders, and has been formed from a variety of sources; namely old hospitals, additions to old buildings, and newly constructed temporary or permanent ones. Many of the older hospital buildings have been pressed into use for military purposes; the staffs are largely recruited from that happy combination of the country practitioner and the West End specialist; the nurses are mostly from the Colonies, Canada contributing the greatest numbers; but it is in the patients that we notice the most marked differences from civil hospital patients in that one finds a group entirely composed of young men—mostly from seventeen to thirty—and, of course, their lesions are the results of war: wounds, "shell shock," *et caetera*, plus the diseases of civil life found in men of that age. The majority of the cases in the general hospitals are surgical, but a few are medical. This picture is quite different, therefore, from the ordinary civil hospital, most notably so in the lack of female patients, children, or the aged, and those with chronic complaints.

But even this narrow field of medicine is not without classification, and the main groups that have resulted from this division are as follows:

1. Wounds of the body, arms or legs.
2. Wounds of the head and brain.
3. Eye wounds.
4. "Shell shock."
5. "Soldier's heart," and
6. A large number of smaller divisions, as injuries of the spinal cord and peripheral nerves, fractures, facial wounds requiring plastic surgery, orthopedic cases, and abdominal wounds.

Also large hospitals are found for the fitting of artificial limbs and for the training of the men in their use, such as the one at Roehampton; there are others for the re-education of the blind. I have seen examples of nearly all of these divisions. The following are a few brief notes on some of them:

Of the big general hospitals of the first class there are many. Some few have been specially built for the purpose, such as the one I shall describe at Cliveden, near Maidenhead. Others are old non-medical buildings—for example, the town hall at Henley, the schoolhouse at Maidenhead, the large New Examination Schools and part of New College and its gardens at Oxford. Everywhere one goes in the Midlands one finds hospitals like the above with the local doctors giving three or four hours a day from their regular practice, which must suffer in consequence. The hearty general practitioner of two years ago, whose practice was largely pediatrics and obstetrics and who made his rounds behind a slow-going horse, now rides a motorcycle with his wife in a side car, dresses in khaki and commands his ward full of Tommies in a thoroughly military manner.

Cliveden is the Astor estate, twenty miles from London. The enormous country house and its vast parks were offered to the military authorities soon after the outbreak of the war. Now the grounds are one big hospital camp with rows of one-story wooden bungalows, faced with wide piazzas on either side; each house containing 30 to 40 beds making a single ward. Nearly one thousand patients are accommodated—mostly men wounded while in Flanders. Although the staff is entirely Canadian, the doctors and sisters having come over for the duration of the war, the patients are from the four corners of the world and here are found, side by side, men from all parts of the British Isles, Canada, South Africa, New Zealand and Australia, India and elsewhere. A more cosmopolitan gathering could hardly be imagined. Another noticeable thing is the great variety of wounds, for apparently no part of the body from the head to the heels is not open to trauma from the shell or shrapnel. One sees a whole piazza full of amputation cases sunning their flap-less, open stumps. In the next ward are found some "shell shock" cases, some dumb, some deaf and others with violent tremors. It was Sir William Osler's visiting day and he had asked Professor C. S. Sherrington and myself to go up from Oxford with him. Most of the time was spent in seeing the neurological cases of which the war has produced a great many. Sir William Osler has pointed out that the "nerve" cases are one of the great problems of the war, especially the functional cases now grouped together by the loose term of "shell shock." The great majority of these cases are now being treated at special hospitals as I shall describe later, so that in a few months a "nerve" case will be practically unknown at Cliveden. The hospital itself consists of the very best type of modern buildings, temporarily raised on a private estate. The operating room and laboratories are excellent and the wards form the most convenient mode of handling a large number of men. The men are brought from the railroad station in motor ambulances where they are quickly looked over by the staff and sent to the operating room, bath or wards. Too much praise cannot be given to the efficient management of this large institution which has practically grown up over night and become an efficient workable military hospital. The men are extremely happy, for they live in the heart of the finest English country, on one of its best estates. Much of the time is spent out of doors, and groups of ambulatory or chair cases may be seen in the nearby woods or on the country roads. Another most important department of the hospital is the training school for convalescents. Land industries are taught by the departmental heads of the Cliveden estate, which include gardening, fence-making, pig keeping, and so on. The workshops train men in carpentering and toy making, and some in cigarette making by machinery. One cannot help but feel that Cliveden stands as the best example of the country base hospital.

Another type of country hospital, but practically in the heart of London, is St. Dunstan's in Regent's Park, London. Here stands, on ten or fifteen acres of the finest park land, a large residence owned by Mr. Otto Kahn. It has been given over for the care of blind soldiers for the duration of the war. The men here are nearly all totally blind and have recovered from their wounds, the hospital being purely for the re-education of the blind man who has "to learn to be blind." It is, therefore, not a medical institution, but a training school. One is struck immediately on entrance by the exceptional situation of this house, surrounded by its green parks, small lakes and forest trees, and, being on high ground, overlooking all London. In the first week of a man's life here every effort is made to keep up his *morale*, by cheerful surroundings and sports. The men walk over the fields, row in the ponds, take rides, swim, listen to music, talk and even dance in the evening with the sisters. It is not uncommon to see groups of men talking and laughing in a good-natured way over the experiences of a new arrival who is just taking his first lessons in learning to be blind. In a few weeks a man becomes more or less accustomed to the perpetual darkness and then he seeks employment. The more industrious learn typewriting, at first with raised type on the keys, but later without it. There is a fine spirit of comradeship among the Tommies, and I watched one of the older patients giving a new man his first lesson. The older was as solicitous and persevering as a mother teaching her child its first steps. One is more impressed by the sadness of the war in seeing these end-results at St. Dunstan's than at any other place. Hundreds of men in the third decade are facing the best of their life with this affliction. The hospital also runs a very large shop where men weave baskets and rugs, repair shoes and do joinery. Many of the soldiers become efficient in massage, telephone operating, and, more especially, in poultry farming and market gardening. After a man's training is complete he is given a start in life. A large after-care department sees that each man obtains employment, loans money to start farms, and sends out trained instructors to "follow up" the men in their work. Thus at St. Dunstan's we have a hospital entirely devoted to the post-medical care of the soldier, work which is most essential in solving the severe social problem of the disabled Tommy.

A third type of military hospital is an old building remodelled and added to in order to meet the demands of the existing conditions. Of this type perhaps the best example is the Mt. Vernon Hospital at Hampstead, a few miles from London, which was formerly a research hospital under the National Medical Research Committee, and devoted largely to the study of tuberculosis. It is now given over to the study of "soldier's heart." This institution is situated on high ground near Hampstead Heath, and contains about 200 beds. "Soldier's heart" is a more or less new disease since the war began. The large majority of the patients show cardiac symptoms without demonstrable organic lesions. The typical case of "soldier's heart" presents dyspnea, even when at rest, rapid pulse, slight enlargement of the heart, and vasomotor disorders. On exertion there is an abnormal increase in the pulse rate. The treatment by a graduated series of exercises has been very efficient. The hospital also takes patients with organic lesions, many of them showing old lesions which have become augmented by the stress of trench life. There are four services of the hospital under the charge of Dr. T. H. Lewis, Dr. J. C. Meakins, Dr. J. Parkinson and Dr. F. R. Fraser, the latter formerly of the Rockefeller Hospital. Sir William Osler, Sir James Mackenzie and Sir Clifford Allbutt are visiting men. It was a pleasure to find, also, two recent Harvard graduates doing research work under Dr. Fraser. In this hospital the staff is dealing with one of the most perplexing of the new problems that the war has presented. The great mass of data collected from electro-cadiograms and Roentgen plates is being carefully put away and will prove most valuable when there is time to correlate it after the war.

Perhaps the most interesting and remarkable cases which the war has produced are those of "shell shock." These have become such an important factor in the number of wounded that special hospitals for their treatment have been built. Such a one is the Maudsley Hospital near London, now under the direction of Major F. W. Mott. This building is only two years old and is specially adapted to the treatment of these nervous cases. It compares favorably in both arrangement and equipment with our Psychopathic Hospital, and in many ways reminds me of it. The laboratories for neuropathology are excellent, and it is here that Dr. Mott has concentrated the work of the County Council Hospitals, work that was formerly done in the well known laboratories at Claybury. The wards contained about 400 "shell shock" cases when I made my visit a few weeks ago. Dr. Mott was kind enough to show me through the laboratories and wards and to explain some of the cases. The whole question of "shell shock" is yet to be elucidated, but Dr. Mott feels that the main factors in its causation are the condition of the man at the time and the results of the explosion of the high power shell. The men when wounded are often in a state of fatigue or sometimes exhaustion from the stress of trench life with its anxious tension and the horror of the sights seen. These factors are combined with the great changes in the air pressure at the time of explosion plus the CO gas evolved, and, as many of these men have a history of a neuropathic constitution before the war, it is not remarkable that the nervous system gives way. There are no visible wounds but, in the few cases that have come to post-mortem, multiple punctate hemorrhages have been found in the brain and spinal cord. This is not unlike the condition found in CO poisoning. The symptoms these men present are most protean. Amnesia, terrifying dreams, mutism and headache are the most common. Tremors and paralysis are not uncommon. The details of these cases are well summarized in Major Mott's article in the *Lancet* of February and March of this year. I was shown the officers' quarters, each with a bedroom and sitting-room. The privates live in large wards with recreation rooms connected. A large garden is worked by the patients. The violently insane cases have padded rooms and equipment for packs and baths such as are found at the Psychopathic. Fortunately, most of the "shell shock" cases recover, although some remain in the hospital for months. Dr. Mott's treatment is very conservative. He says:

"Be cheerful and look cheerful is the note that should ever be sounded to these functional cases. Sympathy should not be misplaced, although it should be shown to all these poor fellows who have a fixed idea of never recovering; it is not their fault, it is a real thing to them, and no one could be more grateful than these cases of functional nervous disability for cheery words. I use many of these cases that have recovered as object lessons. I do not find hypnosis or psychanalysis necessary or even desirable; only common sense and interest in the comfort, welfare and amusement of these neurotic patients are necessary for their recovery." *

These few notes give only the slightest idea of the scope of the work done in England by the Royal Army Medical Corps. The work is an immense task, but I feel sure that no medical group in the world could have responded better than the English doctors have done. Every one is taking some part in this great struggle, and as these men are on call by the military authorities at any time, I feel sure that the damage to their civil practice must be considerable. However, one does not hear complaints from either doctor or patient, and the slogan, "Win the War First," is uppermost in the minds of both.

I am, sir, yours faithfully,

Henry Viets.

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* *Lancet*, 1916, i, 553.

PENNSYLVANIA CONFERENCE OF PHYSICIANS.

Harrisburg, January 20, 1917.

Mr. Editor:—

I have the honor to extend to every physician a most cordial invitation to attend the Conference of Physicians to be held on Friday, February 16th, 1917, at the State Capitol, Harrisburg, under the auspices of the Division of Industrial Hygiene and Engineering of this Department.

The following program will be presented for the consideration of those attending the Conference:

Chairman, Dr. Francis D. Patterson, Chief, Division of Industrial Hygiene and Engineering, Department of Labor and Industry.

1. "The Relation of the Physician to the Compensation Law and Its Proposed Amendments"—Dr. William Ester, South Bethlehem, Pa., Chairman, Committee of Workmen's Compensation, Medical Society of Pennsylvania.

Discussion by Dr. Charles A. E. Codman, President, Medical Society of Pennsylvania.

2. "Compensation for Industrial Diseases"—Dr. Frederick L. Hoffman, Statistician, Prudential Life Insurance Co., Newark, N. J.

Discussion opened by Dr. Alfred Stengel, Professor of Medicine, University of Pennsylvania, Philadelphia, Pa.

3. "The Dawn of a New Surgical Era—The Carrel-Dakin Treatment of Infected Wounds"—Dr. William O'Neill Sherman, Chief Surgeon, Carnegie Steel Company, Pittsburgh, Pa. (Illustrated by Lantern Slides and Motion Pictures.)

Discussion opened by Dr. J. S. Lawrence, Johns Hopkins University, Baltimore, Md.

4. "Treatment of Fractures of the Long Bones from the Viewpoint of Function"—Dr. Edward Martin, Professor of Surgery, University of Pennsylvania, Philadelphia, Pa. (Illustrated by Lantern Slides.)

Discussion opened by Dr. John B. Lowman, Chief Surgeon, Cambria Steel Company, Johnstown, Pa.

5. "National Standards for First Aid"—Dr. Joseph C. Bloodgood, Associate Professor, Clinical Surgery, Johns Hopkins University, Baltimore, Md.

Discussion opened by Major Robert U. Patterson, Medical Corps, United States Army, Washington, D. C.

MOTION PICTURES.

1. "The House That Jack Built,"—Courtesy of Marcus A. Dow, Esq., General Safety Agent, New York Central Lines.
2. "The Curse of the Forest,"—Courtesy of Honorable Robert S. Conklin, Commissioner of Forestry, Commonwealth of Pennsylvania.

Our General Assembly is now in session and amendments to the present Workmen's Compensation Law and the question of compensation for industrial disease are of great importance at this time and will be thoroughly discussed.

Dr. Sherman and Dr. Lawrence have just returned from Europe, and have brought with them much information in regard to the Carrel-Dakin treatment of infected wounds, which is considered by many to be the greatest advance in medical science since the discovery of antiseptic surgery.

The splendid work of Dr. Martin and his colleagues in the American Surgical Association, upon the subject of the treatment of fractures of the long bones, will prove of much interest to those as yet unfamiliar with the conservation of function which follows the proper methods of treatment of such cases.

Standardization of first-aid treatment is an important factor in the prevention of infection, and Dr. Bloodgood will tell of the work of his committee in their nation-wide study of conditions and practice.

It is my hope that the members of the medical profession will be able to coöperate with this Department by having a large representation present at this Conference and, so that the necessary seating arrangements can be made, I shall be appreciative of your courtesy if you will promptly furnish me with the names and addresses of those who will be present and I shall then have the pleasure of forwarding them personal invitations.

Thanking you in advance for your courtesy and coöperation, I am,

Yours faithfully,
JOHN PRICE JACKSON, *Commissioner*,
Commonwealth of Pennsylvania,
Department of Labor and Industry.

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SOCIETY NOTICES.

SUFFOLK DISTRICT MEDICAL SOCIETY.—A regular meeting of the Surgical Section will be held on Wednesday evening, February 14, 1917, at 8.15 P.M., at the Medical Library. The general subject of the evening will be Lung Surgery.

The Surgical Treatment of Bronchiectasis and Advanced Pulmonary Tuberculosis: Dr. Willy Meyer, Professor of Surgery in the New York Post Graduate Medical School and Hospital.

Discussion by:

Dr. Frederick T. Lord
Dr. John B. Hawes
Dr. G. M. Balboni
Dr. George W. Holmes
Dr. Samuel Robinson
Dr. C. L. Scudder

W. J. MIXTER, M.D., *Secretary*. CHARLES L. SCUDDER, M.D., *Chairman*.

THE MASSACHUSETTS THERAPEUTIC MASSAGE ASSOCIATION.—The next meeting will be held at the Hotel Brunswick, Thursday, February 15, 1917, at 7.45 P.M. Mr. David H. Holmes, Director of Massage and Exercise at the McLean Hospital, will address the Society on "Massage and Exercises for the Insane." Miss Lena D. Swinerton, Superintendent of Physical Training and Massage at the Perkins Institution for the Blind, will address the Society on "Treatment of Some of the Postural Defects and Habit Motions Common to the Blind."

DOUGLAS GRAHAM, M.D., *President*
MRS. MABEL F. WALKER, *Secretary*

NEW ENGLAND OPHTHALMOLOGICAL SOCIETY.—The next meeting of the New England Ophthalmological Society will be held at the Massachusetts Charitable Eye and Ear Infirmary, 233 Charles Street, Boston, on Tuesday evening, February 13, 1917, at eight o'clock.

At the annual meeting, held January 9, 1917, the following officers were elected: President, Dr. Henry H. Haskell; Vice-President, Dr. Ralph Carleton; Secretary-Treasurer, Dr. W. Holbrook Lowell.

PROGRAM

Hospital Cases:

American Board for Ophthalmic Examinations, Dr. Walter B. Lancaster.

Glioma Retinae et Atrophia Bulbi, Dr. D. F. O'Connor.

Ocular Changes in Raynaud's Disease, Dr. George S. Derby.

(By invitation)

Fibrolysin in the Treatment of Ocular Diseases, Dr. Robert Scott Lamb, Washington, D. C.

There will be a joint meeting of the New England Ophthalmological Society and the Boston Society of Psychiatry and Neurology on Thursday, April 12, 1917.

W. HOLBROOK, LOWELL, *Secretary*.